TO: Steve Nesta, Karan North, Bob Nininger

FROM: KH-Ecology Group

DATE: May 28, 2004

SUBJECT: USE OF PART II OF THE PROGRAMMATIC BIOLOGICAL ASSESSMENT FOR THE RFETS

The Final Programmatic Biological Assessment (PBA) Part II for the Rocky Flats Environmental Technology Site was recently approved by the U.S. Fish and Wildlife Service. This document covers selected activities that may occur at RFETS and have potential to impact the Preble's meadow jumping mouse (a federally listed threatened species) or the current Preble's mouse protection areas. On April 5, 2004, the U.S. Fish and Wildlife Service, in the Biological Opinion (BO), concurred that these activities may be conducted at RFETS. Per the requirements of the PBA Part II, project management is to receive a copy of Part II of the PBA and a copy of the BO. The PBA Part II and the USFWS BO approving the Part II of the PBA may be found on EDDIE under the Ecology Section, Current Plans and Reports section of the website. Per the requirements of the PBA this is how K-H is providing project management with a complete copy for your records. Please pass this information onto appropriate project personnel. Please note the PBA Part II states: "Project management is responsible to ensure compliance with the requirements and guidelines outlined in Part II of the PBA and BO. Project managers are responsible for following and maintaining the best management practices (BMPs) [as outlined in the PBA]."

Although concurrence has been received for the specific projects listed in the document, the K-H Ecology Group must be contacted prior to commencement of projects authorized within Part II because there are preliminary notifications to the USFWS that must be made. The K-H Ecology Group will provide assistance with project boundary delineation, revegetation information, and any additional information on the minimum best management practices required for the activities under this approval. Activities occurring in Preble's meadow jumping mouse protection areas that are not explicitly outlined in this Part II are not authorized. If you have any questions or your project plans change, please feel free to contact the K-H Ecology Group at x2231 (Jody Nelson), x3560 (Karin Kiefer), or x3687 (Andrew Rosenman). Thank you.

Jody Nelson x2231
Karin Kiefer x3560
Andrew Rosenman x3687

Thank you.

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PROGRAMMATIC BIOLOGICAL ASSESSMENT FOR DEPARTMENT OF ENERGY ACTIVITIES AT THE ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

PART II: Activities that may "Adversely Affect" threatened or endangered species.

April 2004

U.S. Department of Energy
Rocky Flats Field Office
Golden, Colorado

April 2004
Revision 7
Classification Exemption CEX-105-01

Prepared for
US Department of Energy
Rocky Flats Field Office
Golden, Colorado 80402-0464

By
Kaiser-Hill Company, LLC

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
755 Parfet Street, Suite 361
Lakewood, Colorado 80215

April 5, 2004

IN REPLY REFER TO:
ES/CO: ES/LK-6-CO-04-F-012
Mail Stop 65412

Cliff Franklin
Department of Energy
Rocky Flats Field Office
10808 Highway 93, Unit A
Golden, Colorado 80403-8200

Dear Mr. Franklin:

In accordance with section 7 of the Endangered Species Act (Act) as amended (16 U.S.C. 1531 et seq.) and the Interagency Cooperative Regulations (50 CFR 402), this is the U.S. Fish and Wildlife Service's (Service) final biological opinion on impacts to the federally-listed Preble's meadow jumping mouse, *Zapus hudsonius preblei* (Preble's) associated with Part II of the Programmatic Biological Assessment (PBA) for the Department of Energy (DOE) at Rocky Flats Environmental Technology Site (RFETS) located in Jefferson County, Colorado. Your request for formal consultation was received October 15, 2003. The revised PBA Part II with the additional information requested and the notification letter was received on January 20, 2004.

This biological opinion is based on information provided in Part II of the PBA provided on January 20, 2004 and the accompanying maps, telephone conversations, various meetings, field investigations, and other sources of information. A complete administrative record of this consultation is on file at this office.

CONSULTATION HISTORY

DOE, Kaiser-Hill (K-H), and the Service began preliminary discussions about a PBA on June 4, 1998. Discussions about the benefits and the basic outline of contents for the PBA began on March 8, 1999. On July 12, 2000 the Service provided a letter of concurrence on a portion of the projects in the PBA- Part I containing projects with no effects, or projects that were not likely to adversely affect the Preble's mouse. The Service provided comments and requested information on the remaining projects provided by DOE in PBA-I where there was not concurrence. On August 1, 2002 the Service issued a biological opinion on the Water Measurement Flume Replacement Project (USFWS 2002) so that several deteriorated flumes could be replaced. Further discussion of the recommendations and non-concurrence activities was tabled until DOE

reinitiated consultation on the PBA on January 16, 2003. Revisions to the PBA draft were discussed by Service personnel, DOE and K-H on February 11, 20, 21, 24, and 27, 2003. Additional PBA revisions and comments for PBA-I were discussed April 29, 2003 and PBA-II comments were provided by the Service June 18, 2003.

A revised draft PBA was provided by DOE and K-H in October, 2003 for review. On December 18, 2003, the Service received a draft of Part I of the PBA incorporating the previously requested information and revisions along with a letter requesting concurrence by DOE. Part I was submitted separately to expedite the approval process of the activities addressed there while consultation continued on Part II of the PBA.

Species other than the Preble's mouse considered and determined to be not likely to be adversely affected in Part I of the PBA include:

Animals:

American burying beetle (*Nicrophorus americanus*) *	Endangered
Bald eagle (*Haliaeetus leucocephalus*)	Threatened
Black-footed ferret (*Mustela nigripes*)	Endangered
Black-tailed prairie dog (*Cynomys ludovicianus*)	Candidate
Boreal toad (*Bufo boreas boreas*)	Candidate
Canada lynx (*Lynx candensis*)	Threatened
Eskimo curlew (*Numenius borealis*)*	Endangered
Greenback cutthroat trout (*Oncorhynchus clarki stomias*)	Threatened
Least tern (*Sterna antillarum*)*	Endangered
Mexican spotted owl (*Strix occidentalis lucida*)	Threatened
Mountain plover (*Charadrius montanus*)	Threatened
Pallid sturgeon (*Scaphirhynchus albus*)*	Threatened
Pawnee montane skipper (*Hesperia leonardus montana*)	Threatened
Piping plover (*Charadrius melodus*)*	Threatened
Whooping crane (*Grus americana*)	Endangered

Plants:

Colorado butterfly plant (*Gaura neomexicana* ssp. *coloradensis*)	Threatened
Ute ladies' tresses orchid (*Spiranthes diluvialis*)	Threatened
Western prairie fringed orchid (*Platanthera praeclara*)*	Threatened

* Platte River species

In addition, no other species will be adversely affected by Part II activities.

BIOLOGICAL OPINION

This biological opinion is based on information regarding cumulative effects, conditions forming the environmental baseline, the status of Preble's, the importance of the project area to the survival and recovery of the species, and other sources of information as described below. The data used in this biological opinion constitute the best scientific and commercial information

currently available. This biological opinion addresses Part II of the PBA, which addresses activities that may affect and are likely to adversely affect the Preble's mouse.

DESCRIPTION OF THE PROPOSED ACTION

Project Location

The RFETS has been a nuclear industrial facility for the DOE since 1951. RFETS is located in Jefferson County approximately 5 miles southeast of Boulder and 16 miles northwest of Denver. The industrial area (IA) where manufacturing occurred covers about 400 acres of the site. The IA is surrounded by a 5,900 acre buffer zone (BZ), and Public open space lands lie to the west, north, and northwest borders. A housing development is currently located to the northeast, and another development is planned to the southeast. Several gravel mines and light industry sites are located on the western edge of the site. Approximately 750 acres of the western portion of the site are permitted for surface mining (Figure 1).

Project Site Description

Production of nuclear weapon components at RFETS stopped after the Cold War ended. In 1996, DOE, the Environmental Protection Agency (EPA), and the Colorado Department of Public Health and Environment (CDPHE) completed the Rocky Flats Cleanup Agreement (RFCA). The RFCA is the Federal Facility Compliance Agreement and Consent Order negotiated pursuant to the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), the Resource Conservation and Recovery Act (RCRA), and the Colorado Hazardous Waste Act (CHWA). The RFCA provides the regulatory guidance for the accelerated cleanup and site closure to be completed by the end of 2006. After the cleanup is completed and the buildings and various other manmade structures have been decommissioned and demolished, a portion of the site will become the Rocky Flats National Wildlife Refuge.

Project boundaries and project actions have been described based on the best current information available. Project descriptions are based on worst case scenarios with the largest anticipated project disturbance size and impacts to the highest quality habitat included, except where specific plans or information currently exists. Higher quality habitat is defined as all woody vegetation classifications and short marsh, tall marsh, and wet meadow wetland types. Lower quality habitat is defined as all grassland classifications, mud flats, and other disturbed community types.

Due to the accelerated cleanup schedule, it is likely that a number of these projects will be conducted concurrently. These projects are being consulted on because they are likely, but not certain to take place and are within the Preble's protection area. The protection area is designated as a 300 foot zone extending in all directions around Preble's mice telemetry points. In addition, a 100 foot zone extending around suitable Preble's habitat areas without telemetry data is also included in the protection zone (Preble's Protection Plan, Appendix A of Part I of the PBA) (Figure 2). The area of Preble's habitat at the Site is 941.23 acres.

Description of Proposed Project Actions

Monitoring Well Installations

Additional wells may need to be installed site-wide to meet regulatory requirements for monitoring water quality and possible groundwater contamination during and after closure activities. Up to ten of these wells may need to be installed within the Preble's habitat area. Typically during installation, truck-mounted drill rigs will be driven to the well location to bore the well holes. A small amount of soil (1 cubic yard) from the well boring will be spread out in the adjacent vegetation. For the monitoring well installations, 405 square feet per well will be disturbed at an estimated ten different sites. This equates to a maximum disturbance total of 4,050 square feet (0.093 acres). Of the total 0.093 acres disturbed, a total of 0.09 acres will be temporary disturbances for all ten wells. A total of 0.003 acres will be permanently disturbed for all ten wells combined. After installation, the well would need to be monitored periodically for sample collection.

Additional disturbances could result from temporary two tracks becoming established from off-road driving where no established access roads exist. No impacts to water flows or increases in sedimentation are anticipated from this activity.

Original Landfill Project

The remediation plan for this project involves removing radiological hotspots and stabilizing the hillside slopes to prevent further erosion. The cleanup of the landfill is being conducted as a CERCLA action as required by the RFCA. Heavy earthmoving equipment will be used to complete this project. Large areas of the hillside may need to be scraped off and recontoured with additional fill material. The South Interceptor Ditch (SID) would be removed as part of the cleanup activity. The project area is about 20 acres in size and could impact a total of 9.10 acres of Preble's habitat, including 2.76 acres of high quality woody riparian habitat along several hundred feet of the north edge of Woman Creek. Most of the project is located in an old landfill vegetated with smooth brome (*Bromus inermis*), intermediate wheatgrass (*Elytrigia intermedium*), and diffuse knapweed (*Centaurea diffusa*). Although this disturbance will be temporary, the remediation work is expected to take several months to complete.

Pond Remediation and Removal

The ponds included in the remediation and removal project include A-1, A-2, A-3, B-1, B-2, B-3, B-4, in Walnut Creek, as well as the C-1, C-2 ponds and associated diversion and bypass structures found near the C-2 pond in Woman Creek. The project may also require the removal of the associated underground pipelines and valve boxes that are used to transfer water from one pond to another. These pipelines are typically buried adjacent to the pond edges and run between the ponds. Characterization of pond sediments may be conducted prior to remediation activities to determine the need for remedy. Characterization involves sampling the sediments on the pond bottoms either by foot or boat, depending on water levels. Remediation activities would include removal of contaminated sediments from the pond bottoms and stream channels. Pond removal activities may include removal of the dams and spillway structures and

recontouring the stream drainage and channel. Removal may also include breaching of the dams or leaving some type of lowhead dam structure in place to maintain the wetlands behind the dams. If the dams are not removed, then dam maintenance activities would need to continue indefinitely. Heavy equipment would be required for pond remediation or removal activities.

At the C-2 pond location, the Woman Creek bypass structure and diversion ditch that diverts water from the natural stream channel around the C-2 pond may be removed. The large riprap and concrete bypass structure in the creek channel above the C-2 pond may be taken out and the natural stream channel reestablished to allow the stream to flow into C-2. The diversion ditch may be filled in and recontoured to match the natural landscape. The outlet works for C-2 pond need to be redesigned to function properly to allow for water releases from the pond. If the bypass structure and diversion ditch are not removed, repairs to the riprap drop structures in the diversion ditch will be necessary to prevent further ditch erosion. In either case, future work activity would remain within the project boundary.

In the A-series ponds, a total of 14.82 acres of current Preble's habitat could be disturbed (Figure 2). In the B-series ponds, a total of 12.59 acres of current Preble's habitat could be disturbed (Figure 2). In the C-series ponds, a total of 9.99 acres of current Preble's habitat could be disturbed (Figure 2). In the A- and B-series ponds, impacts would be temporary. In the C-series, most of the work in the C-2 pond area would create temporary disturbances. However, approximately 1.87 acres in current Preble's protection areas would be permanently lost if the bypass channel and diversion ditch are filled in. The open surface area of the ponds has been subtracted from the total disturbance calculations because open water is not considered to be Preble's habitat. If the open areas of the ponds are converted to habitat suitable for Preble's through pond removal, higher quality habitat could be increased by 2.65 net acres.

Surface Water Monitoring Equipment Removal

Most of the old surface water monitoring instrumentation housings, concrete pads, posts, and signage will probably be removed as part of cleanup and closure. Although vegetation type, and the presence of the Preble's mouse varies by individual site, all of these structures are located within Preble's habitat in the Walnut and Woman Creek drainages. Existing roads or two tracks are used to access most of the locations, however some off-road travel may prove necessary. Some shrubs may need to be clipped so monitoring equipment can be removed. Heavy equipment may be needed for removal of larger structures. A maximum of 1.0 acre of temporary disturbance is anticipated to occur.

Surface Water Permanent Flume Installations and Replacement

Surface water flumes are used to monitor water flows and to obtain automated grab samples for contaminant analyses. Although there are no current plans to add or replace permanent flumes, it is possible that one flume may need to be replaced before site closure. Permanent flumes are large concrete structures that require the use of heavy equipment and up to three months to complete construction. Total disturbance area would be 0.5 acres in size, and would be temporary in nature. Because a new flume would be replacing a structure of the same size, no additional permanent impacts will result. Two deteriorated, permanent surface water flumes were replaced during 2002/2003 under a biological opinion provided by the Service in 2002.

Surface Water Flume Removal

Temporary and permanent surface water flumes have been used to monitor water flow and for automated grab samples for contaminant analyses. Several flumes that are no longer being used will be removed, in addition to several more where use will be discontinued before site closure. Established roads already exist for most of the flumes as they have been monitored for years.

Temporary flumes are small structures (12x3 feet) that are made of a fiberglass body, plastic sheeting wings, wooden beams, and sand bag anchors. These flumes would be dismantled by hand, and a vehicle used to haul off the components. The total temporary disturbance for the removal of temporary flumes is not expected to exceed .10 acres.

Permanent flumes are large concrete structures, and will require driving heavy equipment to the flume for removal, and a roll-off container or dump truck for hauling debris off-site. The total disturbance footprint for all of the flumes would not exceed 0.45 acres in size.

North Access Road and Culvert Removal Project

The north access road and some culverts are planned for removal as part of the IA regrading plan. Except for a small portion east of the north access road, most of the culverts and the road to be removed are not in the Preble's protection area. The roads will be removed by heavy earthmoving equipment, and will include asphalt removal and ripping of the roadbed before reseeding. Areas where culverts are removed will be recontoured as a stream channel. The total disturbance to Preble's protection areas will be 1.83 acres in lower quality habitat, and 0.23 in higher quality habitat.

Approximately 12 cement culvert sections that remain from an abandoned roadbed across the Woman Creek stream bottom may be removed as part of site cleanup operations. Culvert sections would be lifted by a crane or hoist and then placed on a truck to be removed from the area. A limited amount of off-road driving in mesic grassland will be necessary for crane access and staging. Some vegetation may be trampled from foot traffic as well. Temporary disturbance to 0.40 acres for lower quality habitat and 0.20 acres of higher quality habitat is anticipated for this activity. In the long term, successful revegetation and stream realignment in this area would restore Preble's travel corridors and reduce habitat fragmentation.

Dam Maintenance and Safety Activities

Dam safety inspections are conducted periodically throughout the year. The Federal Energy Regulatory Commission and the State of Colorado have requested that all vegetation obscuring visual inspection of the outlet area and upstream slopes be removed so that seepage from low-level pipes can be monitored throughout the year. Removal will involve mowing, hand clipping, and weed whacking on the dam toes, outlet works, and both interior and exterior dam faces. Affected dams within the Preble's protection area include the A-1– A-3, C-1, and B series ponds. These areas will be accessed on foot. A total of 3.16 acres of lower quality habitat, and 0.22 acres of higher quality Preble's habitat will be permanently disturbed.

For safety reasons, additional riprap must occasionally be placed on dam faces or spillways to protect these structures and the downstream areas. Heavy equipment will be required for this work, but the equipment will remain on the dams or spillway areas and will not affect Preble's habitat.

Waste Water Treatment Plant (WWTP) Removal

The WWTP treats 150,000 gallons of site-generated non-hazardous, non-radioactive liquid, sanitary waste daily to meet National Pollutant Discharge Elimination System requirements. The waste is treated with activated sludge, tertiary clarification, sand filtration, and ultra-violet light disinfection, and then is released into South Walnut Creek through a pipeline. The treatment structure will be removed prior to site closure. Approximately one third of the WWTP lies within the Preble's habitat protection area boundary. The WWTP buildings and parking lots are not considered to be suitable Preble's habitat, however some reclaimed grassland and riparian vegetation just to the south may be disturbed in conjunction with the North Access and Culvert Removal project described previously. The WWTP removal project is expected to disturb 0.28 acres of roads, parking, and building areas (See PBA Figure 2 map.).

Platte River Water Depletions and Preble's Mouse Water Reduction Issues

Cessation of the release of Waste Water Treatment Plant (WWTP) effluent into Walnut Creek is not considered to be a depletion of the Platte River system. Further, discontinuing the purchase of water from the Denver Water Board that is currently used for sanitary needs by on-site personnel, and the removal of impervious surfaces and returning them to a more natural state also do not constitute a depletion according to current Service policy (Don Anderson, personal communication, 2004).

However, these closure activities will have an impact on Preble's mouse habitat in the Walnut Creek drainage. A Site-Wide Water Balance (SWWB) modeling study provides an estimation of changes in surface and subsurface hydrology at the Site. Results from the model indicate substantial changes in the hydrology of Walnut Creek. Walnut Creek discharges decreased for the following three reasons: (1) WWTP contributions to Walnut Creek were eliminated; (2) impervious surfaces in the Industrial Area (IA) were removed, thereby eliminating fast runoff and increasing the amount of surface water infiltration in the IA; (3) building drain discharges to IA streams were eliminated. Potential effects of these changes are discussed in the biological assessment.

Based on the SWWB (K-H 2002b), under the No Imported Water Scenario, modeled off-Site surface discharge in Walnut Creek decreased from about 800,000 m^3/year to 510,000 m^3/year in wet years, and from 450,000 m^3/year to 190,000 m^3/year in dry years. Under the Land Configuration Scenario, off-Site surface discharge in Walnut Creek decreased from approximately 800,000 m^3/year to 180,000 m^3/year in wet years. In dry years the modeling showed a decrease from 450,000 m^3/year to 20,000 m^3/year. The Land Configuration Scenario described the combined effect of no imported water in addition to reduced water from surface water flows in the IA. Overall reductions of water flow at the Site boundary in Walnut Creek are estimated to range from about 78 percent in wet years to about 96 percent in dry years.

Additionally, the study showed that in Woman Creek, surface flows exiting the Site near Indiana Street will be largely unaffected by changes resulting from site closure activities. Wet year or dry year water flows remained at about 200,000 m^3/year during wet years, and at slightly below 100,000 m^3/year in dry years. Upstream of the C-2 pond no changes in surface flows are expected as a result of IA cleanup and closure actions because currently no water reaches the stream from the IA due to its diversion through the South Interceptor Ditch (SID). Although runoff in the SID basin is expected to decrease as a result of changes in the IA, no discharges were predicted for Pond C-2 in any of the scenarios modeled. As a result, little change should occur in Woman Creek flows.

No changes are anticipated in the Rock Creek drainage as a result of closure activities because this watershed is isolated from the IA closure activities.

Unforeseen Projects Inside Current Preble's Protection Areas

To avoid possible work delays, there potentially could be an additional 2 acres of disturbance in Preble's habitat resulting from unforeseen project activities that would adversely affect the Preble's mouse. These activities could cause a permanent loss of habitat of 0.25 acres maximum. Any use of the two-acre allotment will be documented and the pertinent information provided to the Service.

Conservation Measures

Actions in the project description that the project proponent will implement to reduce impacts of the action or further the recovery of threatened and endangered species are known as conservation measures. As part of the proposed action, the beneficial effects of these conservation measures are taken into consideration in the jeopardy and incidental take analyses. Conservation measures are part of the proposed action and their implementation is required under the terms of this consultation. Specific conservation measures identified in the biological assessment and included in this biological opinion that will benefit threatened and endangered species are detailed in the following section.

General Measures and Best Management Practices (BMPs)

1. Identify and prioritize Preble's habitat areas that are subject to disturbance and design activities to avoid areas of higher habitat value. For example, large willow patches will be avoided, except where the project cannot be completed without impacts.
2. Reduce the impact footprint (i.e., no walking in area beyond what is necessary to accomplish the work, minimizing laydown area and equipment storage locations).
3. Conduct activities during daylight hours, when the Preble's mouse is less active, when scheduling during the hibernation season of the mouse cannot be accomplished.
4. Minimize the length of time spent in sensitive areas (getting work done as quickly as possible, and not reentering the area once work is completed).
5. Explore options with project designers to avoid and/or minimize impacts to the Preble's mouse.
6. Use established roads (i.e., paved, gravel, two-track, historically-used routes to monitoring locations) for vehicle traffic. If an established road does not exist, use the

safest and most direct route that minimizes impacts to the habitat and has been predetermined by an entity familiar with Preble's habitat use.

7. Limit equipment entrance/exit areas to the minimum number necessary to accomplish the work.
8. Limit vegetation disturbance through alternative actions. For example, prune trees/shrubs rather than remove trees/shrubs; cut shrub stems to allow re-growth rather than grubbing out the entire root system.
9. Remove trash and unnecessary equipment in project areas after work is completed.
10. Revegetate all disturbed Preble's habitat with suitable native species at 2:1 ratio in higher quality habitat, 1.5:1 in lower quality habitat, after the activity has been completed. Refer to Table 1 and the Habitat Mitigation Techniques Plan (Appendix A, Part II of the PBA).
11. When revegetation activities cannot be completed immediately after project completion (i.e., outside optimum seeding window) use alternative erosion controls to control potential erosion and sedimentation problems. Use redundant erosion controls where appropriate.
12. Utilize erosion controls (i.e., silt fence, erosion blankets, hay bales, mulching, tackifiers, surface roughening) on all appropriate cleanup projects to control erosion and sedimentation problems. Utilize photo or biodegradable erosion blankets that will not entangle Preble's and other wildlife. For large areas, minimize exposed surfaces. Project personnel will be responsible to monitor erosion control effectiveness and modify control techniques as needed (especially after precipitation events). Monitoring will be conducted weekly or more frequently as needed (after precipitation events). Projects will maintain and repair erosion controls through project completion.
13. Monitoring of mitigation actions will be conducted according to the Mitigation Monitoring Plan (Appendix B of Part II of the PBA).
14. Prevent spilled fuels, lubricants or other toxic materials from entering Preble's habitat through the use of spill containment devices.
15. Minimize project activities in wet areas and wet conditions to avoid damage to the habitat.
16. Use the least amount of and/or smallest equipment necessary to accomplish the work.
17. Do not clean equipment in Preble's mouse habitat or in areas where runoff will enter Preble's mouse habitat.
18. Staging areas will be located either outside of Preble's habitat, or within the defined project footprint.
19. Do not use Preble's mouse habitat as borrow areas.
20. Inspect and clean equipment of weeds/seed to prevent the spread of noxious weeds to other locations.

Activity Specific Measures

Monitoring Well Installations

1. Excavated soil from bore holes will be spread out on the surrounding area to a depth of less than 1" to avoid burying vegetation.

Original Landfill Project

1. If construction will likely occur during the hibernation period (October – April), trim back and prune woody vegetation where practicable within Preble's habitat the previous August.

2. Retain woody root systems where remedy regulation guidelines permit.

3. If the alteration of stream flows becomes necessary, or excessive sedimentation, as evidenced by visible plumes in the stream, occurs in riparian habitat outside of the project footprint, the Service will be notified, and sediment control methods will be re-evaluated. Additionally, if rills or gullies occur in graded areas, the Service will be notified, and erosion control methods will be re-evaluated.

Pond Remediation and Removal

1. If construction will likely occur during the hibernation period, trim back and prune woody vegetation where practicable within Preble's habitat the previous August.

2. Retain woody root systems where remedy regulation guidelines permit.

3. Revegetate areas of pond removal with appropriate mesic or wetland native plant species.

4. Maintain redirected stream flows when de-watering of the ponds is necessary during remediation activity.

5. Contour disturbed areas to match surrounding areas.

Surface Water Flume Removal

1. Contour disturbed areas to match surrounding areas.

North Access Road and Culvert Removal Project

1. Alleviate compaction of roadbed areas before seeding operations through ripping, plowing and or discing to a minimum depth of 24 inches to allow successful revegetation.

Additional details of proposed conservation measures are provided in the PBA Part II, Preble's Protection Plan, Revegetation Plan Revision 2, and other materials.

Status of the Species/Critical Habitat

Preble's is a small rodent in the family Zapodidae and is 1 of 12 recognized subspecies of the species *Z. hudsonius*, the meadow jumping mouse. Preble's is native only to the Rocky Mountains-Great Plains interface of eastern Colorado and southeastern Wyoming. This shy,

largely nocturnal mouse lives in moist lowlands with dense vegetation. Adult Preble's are up to 8 to 9 inches long (its tail accounts for 60 percent of its length) with hind feet adapted for jumping. Preble's hibernate underground from September to May.

Records for Preble's meadow jumping mouse define a range including Adams, Arapahoe, Boulder, Denver, Douglas, El Paso, Elbert, Jefferson, Larimer, and Weld counties in Colorado; and Albany, Laramie, Platte, Goshen, and Converse counties in Wyoming (Krutzsch 1954, Compton and Hugie 1993). Armstrong et al. (1997, p. 77) described typical Preble's meadow jumping mouse habitat as "well-developed plains riparian vegetation with relatively undisturbed grassland and a water source in close proximity." Also noted was a preference for "dense herbaceous vegetation consisting of a variety of grasses, forbs and thick shrubs." Shenk (2000) conducted radio tracking studies at three sites and document greater use of upland habitats than previously assumed.

Preble's has undergone a decline in range and populations within its remaining range have been lost. Habitat loss and fragmentation resulting from human land uses have adversely impacted Preble's populations. David Armstrong (University of Colorado, 1998) concluded that the meadow jumping mouse, in this region as elsewhere, is a habitat specialist, and that the specific habitat on which it depends is declining.

Compton and Hugie (1993, 1994) cited human activities that have adversely impacted Preble's meadow jumping mouse including: conversion of grasslands to farms; livestock grazing; water development and management practices, and, residential and commercial development. Shenk (1998) linked potential threats to ecological requirements of Preble's meadow jumping mouse and suggested that factors which impacted vegetation composition and structure, riparian hydrology, habitat structure, distribution, geomorphology, and animal community composition must be addressed in any conservation strategy.

Residential and commercial development and associated infrastructure, including highway and bridge construction, and instream alterations to implement flood control, directly removes Preble's meadow jumping mouse habitat, or reduces, alters, fragments, and isolates habitat to the point where Preble's meadow jumping mouse can no longer persist. Corn et al. (1995) proposed that a 100 meter (328 foot) buffer of unaltered habitat be established to protect the floodplain of Monument Creek from a range of human activities that might adversely affect Preble's or its habitat. Roads, trails, or other linear developments through Preble's habitat may act as barriers to movement. Shenk (1998) suggested that on a landscape scale, maintenance of acceptable dispersal corridors linking patches of Preble's habitat may be critical to its conservation.

Further information about the biology and status of the Preble's can be found in the report "Conservation Assessment and Preliminary Conservation Strategy for Preble's Meadow Jumping Mouse (*Zapus hudsonius preblei*)" (Shenk, 1998, available on request).

Environmental Baseline

Preble's mice have been captured in all of the site's major drainages: Rock, Woman, North and South Walnut Creeks. Although the habitat quality varies widely, all of the drainages contain the

dense herbaceous understory, shrubbery, and open overstory associated with Preble's habitat. Introduced and noxious plant species are also present in all of the drainages despite intense site-wide weed control efforts. Previous trapping and telemetry studies indicate that these riparian areas are extensively utilized by Preble's for feeding, nesting, breeding, dispersal, and/or hibernation. There are approximately 941.23 acres of Preble's habitat at the Site.

Preble's have been captured near the A-series ponds above the A-3 pond, B-series ponds above the B-5 pond, and adjacent to the C-series ponds above and below the C-1 pond, between the C-1 and C-2 ponds, but not below the C-2 pond or in the diversion ditch around C-2. In the pond areas, habitat consists of open water ponds surrounded by short and tall marsh habitats along pond edges, and grasslands in the surrounding upland areas. At some locations upstream and downstream of the ponds and dams themselves, coyote willow, plains cottonwood, and false indigo are commonplace. No mice have been trapped downstream from the C-2 pond, possibly due to the more xeric conditions and lack of a significant shrub vegetation layer.

The xeric tallgrass prairie, tall upland shrubland, wetland, and Great Plains riparian woodland vegetation types present on-site have been identified by the Colorado Natural Heritage program as increasingly rare and unique (Figure 3).

EFFECTS OF THE ACTION

For determination of impacts to Preble's habitat, habitat quality was defined based on the 1996 Site vegetation map that was used to produce the current Preble's protection plan map. Using the Site's Geographic Information System (GIS), project footprints and the current Preble's protection area GIS coverages were overlain to determine the amount of area specific projects might impact in Preble's habitat. With this information, the 1996 vegetation map was used to identify different plant communities and habitat types within the potentially affected Preble's habitat. Higher quality habitat is defined as all woody vegetation classifications and short marsh, tall marsh, and wet meadow wetland types. Lower quality habitat was defined to include all grassland classifications, mud flats, and other disturbed community types. Open water, riprap, concrete, roads, and structures were not considered habitat for the Preble's mouse. This information was used in the GIS effort to calculate the total number of acres of potential temporary and permanent impacts to both lower and higher quality habitat within project footprints. Any areas where additional riprap, concrete, roads, or structures are placed in the future will be considered as permanent habitat loss for Preble's.

Table 1. Anticipated effects of cleanup actions to Preble's habitat.

Project	Temporary (Acres)		Permanent (Acres)		Location/ Drainage	Total Disturbance (Acres)
	Habitat Type		Habitat Type			
	Low*	High+	Low	High		
Monitoring Well Installations	0	0.09	0	0.003	Various	0.09
Original Landfill	6.34	2.76	0	0	Woman Creek	9.1
Pond Remediation						
A Series	11.5	3.07	0	.25	Walnut Creek	14.82
B Series	10.48	1.78	0	.33	Walnut Creek	12.59
C Series	6.65	2.05	0.98	.31	Woman Creek	9.99
PondsTotal	28.63	6.9	0.98	.89		37.4
Surface Water Monitoring Equipment Removal	0	1.0	0	0	Walnut and Woman Creek	1.0
Surface Water Permanent Flume Installations/ Replacement	0	0.5	0	0	Walnut and Woman Creek	0.5
Surface Water Permanent Flume Removal	0	0.55	0	0	IA/Walnut, Rock, Woman Creek	0.55
North Access and Culvert Removal	2.23	.43	0	0	Walnut Creek	2.66
Dam Maintenance	0	0	3.16	0.22	Walnut and Woman Creek	3.38
Waste Water Treatment Plant						
Unforeseen Projects	0	1.75	0	0.25	Various	2.0
TOTAL	37.2	13.98	4.14	1.36		56.68
MITIGATION TOTAL	55.8	27.96	6.21	2.72		92.69

* Lower quality habitat is defined as all grassland classifications, mud flats, and other disturbed community types. A 1.5:1 mitigation ratio will be used in this habitat type. For determination of impacts within current Preble's protection areas, habitat quality was defined based on the 1996 site vegetation map.

+ Higher quality habitat is defined as all woody vegetation classifications and short marsh, tall marsh, and wet meadow wetland types. A 2:1 mitigation ratio will be used in this habitat type

Activities in Part II of the PBA will disturb 56.7 acres of Preble's habitat in total. This accounts for approximately 6.0 percent of total existing Preble's habitat on the Site. Of this area, 51.2 acres (5.4 percent of the existing habitat) could be temporarily affected and 5.5 acres (0.6 percent of the existing habitat) could have permanent impacts to habitat. Preble's individuals may be taken due to construction and/or restoration, enhancement, and/or revegetation efforts within their habitat. Additional take is expected to result from indirect effects due to habitat modification and destruction.

Secondary impacts of the proposed projects to Preble's may include temporary increases in noise, light, dust, stormwater runoff and sedimentation, pollution, disruption of travel corridors, and human activities related to the normal implementation of the project activities in the PBA.

The removal of the north access road, associated culverts, and buildings along with the creation of a section of new stream reaches to connect drainage areas will restore travel corridors and potentially add approximately 41 acres of suitable habitat upon subsequent revegetation.

Project sites that involve the removal of buildings, roads, riprap, and structures will be revegetated with native species, eventually resulting in an improved, more natural state for Preble's and other wildlife. Higher quality Preble's habitat will be revegetated at a 2:1 ratio of mitigation acres to potential impact acres. Lower quality areas will be revegetated based on a 1.5:1 ratio.

The final approval of acreages credited as appropriate and successful mitigation for impacts to Preble's mice will be determined by the Service.

CUMULATIVE EFFECTS

Cumulative effects include the effects of future State, tribal, local or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action, including the possible development of new section of the 470 highway corridor nearby, are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

Substantial development is occurring in Jefferson County. Various development projects are planned adjacent to RFETS, both upstream and downstream from the project site. While development in other areas of Jefferson County that contain Preble's habitat may undergo section 7 review, others may not. In the latter case, projects would be required to pursue Habitat Conservation Plans (HCPs) and section 10 permits where take of Preble's is likely. Jefferson County and other local jurisdictions are in the process of developing a county-wide HCP for Preble's. It is not clear how a county-wide HCP, if approved, will affect future development that may impact Preble's. However, the Service is required to conduct internal section 7 review of issuance of section 10 permits that may result from these HCPs. Future development in the area may result in a variety of direct and secondary impacts to Preble's and its habitat.

CONCLUSION

After reviewing the current status of Preble's, the environmental baseline for the action area, the effects of the proposed development and the cumulative effects, it is the Service's biological opinion that the action, as proposed, is not likely to jeopardize the continued existence of Preble's. Approximately 0.6 percent of existing Preble's habitat at RFETS will be permanently affected, and approximately 5.4 percent will be temporarily affected by the proposed activities.

Although the proposed projects will adversely affect Preble's and its habitat at RFETS in the short term, conservation measures and BMPs will avoid jeopardy to the species. Critical habitat was not designated in the project area, therefore none will be affected.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulations pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Harass is defined by the Service as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

The measures described below are non-discretionary, and must be undertaken by DOE so that they become binding conditions of any grant or permit issued to the applicant, as appropriate, for the exemption in section 7(o)(2) to apply. The DOE has a continuing duty to regulate the activity covered by this incidental take statement. If the DOE (1) fails to assume and implement the terms and conditions or (2) fails to require the applicant to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, the applicant must report the progress of the action and its impact on the species to the Service as specified in the incidental take statement. [50 CFR §402.14(i)(3)]

Amount or extent of take anticipated

The Service anticipates incidental take of Preble's through direct killing and by loss of food, cover, and other essential habitat elements. This take will be difficult to detect because of their small size and hibernation underground. The Service anticipates that the proposed action will result in incidental take of an undetermined number of Preble's individuals through both direct take and through habitat destruction, due to the temporary loss of 51.2 acres of Preble's habitat, and the permanent loss of 5.5 acres of Preble's habitat for a total of 56.7 acres.

In this biological opinion, the Service determined that this level of anticipated take is not likely to result in jeopardy to the species or destruction or adverse modification of critical habitat.

Reasonable and Prudent Measures

The Service believes the following reasonable and prudent measure(s) are necessary and appropriate to minimize impacts of incidental take of Preble's:

1. The DOE will monitor the extent of habitat impacted to ensure that it does not exceed the authorized area or the authorized take limits.

2. The DOE will require timely revegetation and enhancement of the project area, as described in the conservation measures and project descriptions, to minimize the disturbance to Preble's habitat.

3. The DOE will ensure that mitigation efforts are successful in protecting, restoring, and enhancing Preble's habitat and report on its progress.

Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the Act, the DOE must comply with the following terms and conditions, which implement the reasonable and prudent measures described above and outline required reporting/monitoring requirements. These terms and conditions are **non-discretionary**.

1. To implement Reasonable and Prudent Measure #1, the DOE shall:

   a. Ensure that BMPs designed to minimize take are implemented and are successful, including those for revegetation and erosion control.

   b. Ensure that Preble's habitat not designated for remedy, construction or restoration actions will be marked off with erosion barrier or other appropriate fencing to prevent inadvertent impacts to habitat outside the project footprint.

   c. Collect geospatial data on the actual footprint of disturbance after the activity is completed.

   d. Ensure that workers on-site will be informed about the reason for and importance of limiting disturbances and impacts to Preble's habitat outside of the fenced work areas.

2. To implement Reasonable and Prudent Measure #2, the DOE shall:

   a. Ensure seeding is completed as soon as the planting windows/timeframe allows.

3. To implement Reasonable and Prudent Measure #3 above, the DOE shall:

a. Conduct monitoring of restoration and enhancement efforts, which shall include photographs, geospatial data, spreadsheets, and other necessary information to determine the extent and effects of construction and the implementation and effectiveness of such efforts, until success criteria as defined in Appendix B of the PBA Part II are met. Reports of this information shall be forwarded to the Service after each growing season and prior to December 1.

b. Monitor habitat restoration and enhancement areas for a minimum of three growing seasons, and until such time as DOE and the Service determine that the required restoration and enhancement have met the success criteria (PBA Part II, Appendix B, Mitigation Monitoring Plan). If supplemental irrigation of habitat restoration or enhancement vegetation is provided, success shall be assessed by the Service only after at least two growing seasons without supplemental irrigation.

c. Ensure implementation of habitat restoration and enhancement is supervised by an entity experienced in reclamation or habitat restoration.

d. Continue to implement weed control efforts site-wide to prevent the further spread of noxious weeds.

4. To implement all Reasonable and Prudent Measures (#1 through #3) DOE shall:

a. Provide advance notice to the on-site Service representative on project activities planned for the upcoming week in Preble's habitat areas.

b. Provide access for inspection at any time by the on-site Service representative, with the proper accommodations made for any safety requirements for the work site.

c. Provide notification upon initiation of disturbance resulting from project activities to the on-site Service representative.

d. Provide notification of final sign-off on project activities in Preble's habitat areas to the on-site Service representative.

e. Provide updated Preble's Mouse Mitigation Debit/Credit Spreadsheet (PBA Part II, Appendix G) information as projects and mitigation efforts are completed on a monthly basis to the on-site Service representative.

f. Develop an adaptive management strategy with assistance from the Service for changes on RFCA requirements and site conditions.

5. Develop an adaptive management strategy with assistance from the Service that will address the potential habitat loss due to hydrologic changes in the Walnut and Woman Creek drainages. Such a strategy will describe how habitat will be measured, how loss

will be determined, and the steps that will be taken to compensate for that habitat loss, should it occur.

6. In the unlikely event that a Preble's mouse is encountered (dead, injured, or hibernating) during construction activities, the Colorado Field Office of the Service will be contacted at (303) 275-2370 immediately.

The Service believes that no more than 56.7 acres of Preble's habitat will be adversely affected as a result of the proposed action. The reasonable and prudent measures, with their terms and conditions of implementation, are designed to minimize the impact of incidental take that might otherwise result from the proposed action. If, during the course of the action, this level of incidental take is exceeded, such incidental take represents new information requiring reinitiation of consultation and review of the reasonable and prudent measures provided. The DOE must immediately provide an explanation of the causes of the take exceedences and review with the Service the need for possible modification of the reasonable and prudent measures.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

The Service recommendations are as follows:

1. Provide Preble's habitat enhancement through the Service-facilitated negotiations on the procurement of a conservation easement on the grazing rights, and by fencing the riparian corridor and adjacent pastures for conservation grazing, (in Section 16) to enhance approximately 144 acres of riparian habitat in the headwaters of Woman Creek.

2. Remove non-terminal ponds, dams and current spillway structures in the Walnut and Woman Creek drainages, leaving some type of lowhead dam structure in place to maintain the wetlands in place behind the dams. Recontour the stream drainage and channel to a more natural alignment to mitigate the possible effects on Preble's from decreased water flow in the Walnut Creek drainage.

3. Minimize the amount of riprap used for streambed stabilization; utilize alternate methods such as check dams and lowhead structures to control water flow and erosion to create more suitable Preble's and wildlife habitat.

4. Obtain the surface mineral mining rights in Section 9 in the west spray field to maintain the integrity of headwaters of Walnut Creek and enhance suitable habitat downstream.

5. Re-seed areas currently being mowed for dam maintenance activities with lower height native species such as blue grama, and western wheatgrass that will not require frequent mowings.

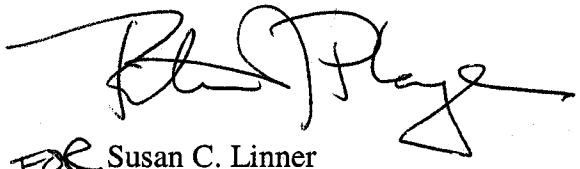
In order for the Service to be kept informed of actions minimizing or avoiding adverse effects or benefiting listed species or their habitats, the Service requests notification of the implementation of any conservation recommendations.

REINITIATION NOTICE

This concludes formal consultation on the action(s) outlined in the request. As provided in 50 CFR §402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

If the Service can be of further assistance, please contact Amy Thornburg at (303) 966-5777.

Sincerely,



FOR Susan C. Linner
Colorado Field Supervisor

cc: Dean Rundle, USFWS
Andrew Rosenman K-H
Jody Nelson, PEG

Thornburg, PBAII/ESRF/3/25/04

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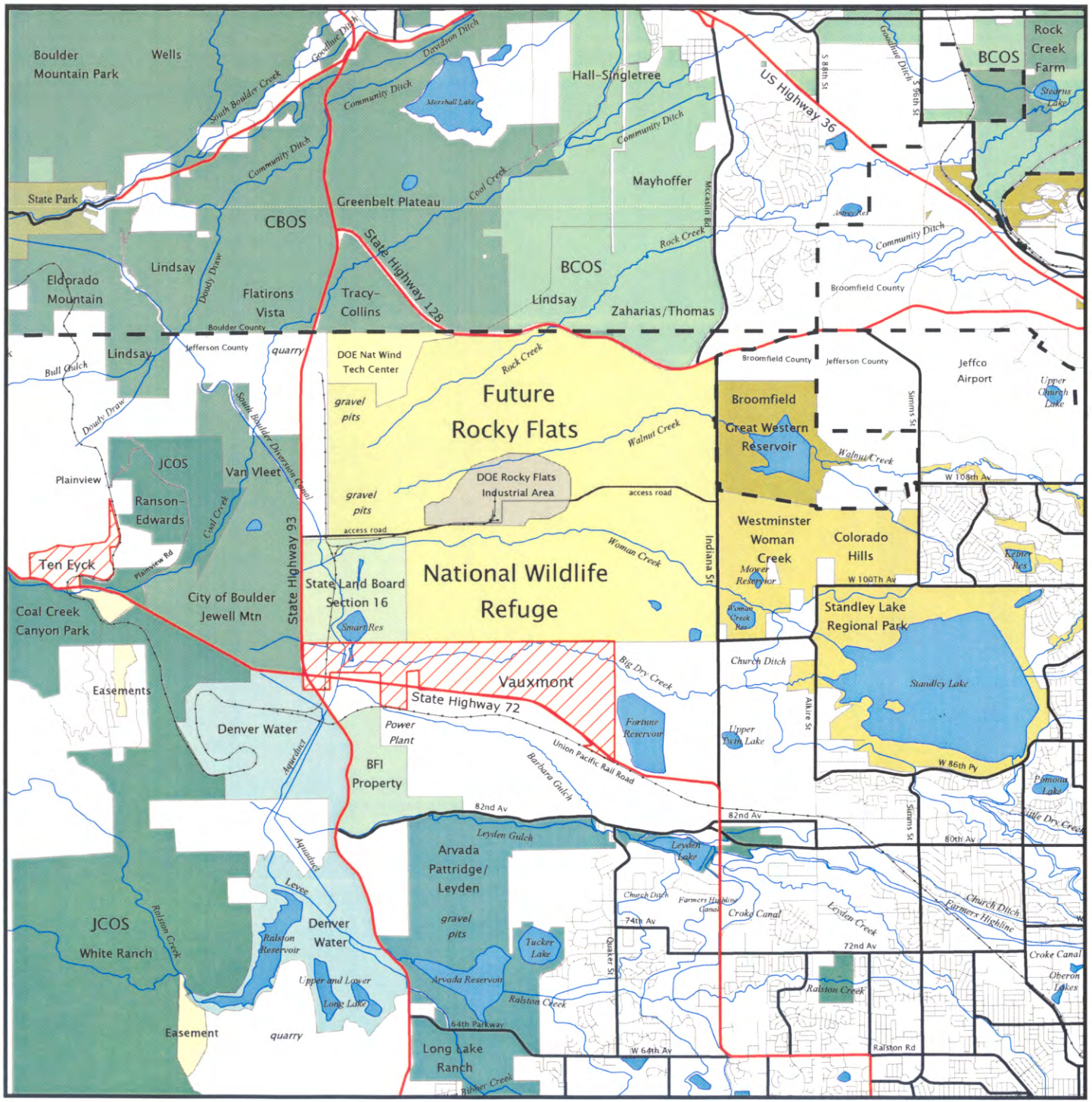


NJAG

Figure 1

Map of Open Space and Natural Lands

Open Space

- Rocky Flats
- Boulder County
- Jefferson County
- Arvada
- City of Boulder
- Broomfield
- Westminster

Other Open Lands

- BFI Property
- Conservation Easements
- Denver Water
- Nat Wind Tech Center
- State Land Board

Note: Transparent colors in map may vary from those in legend.

Other Features

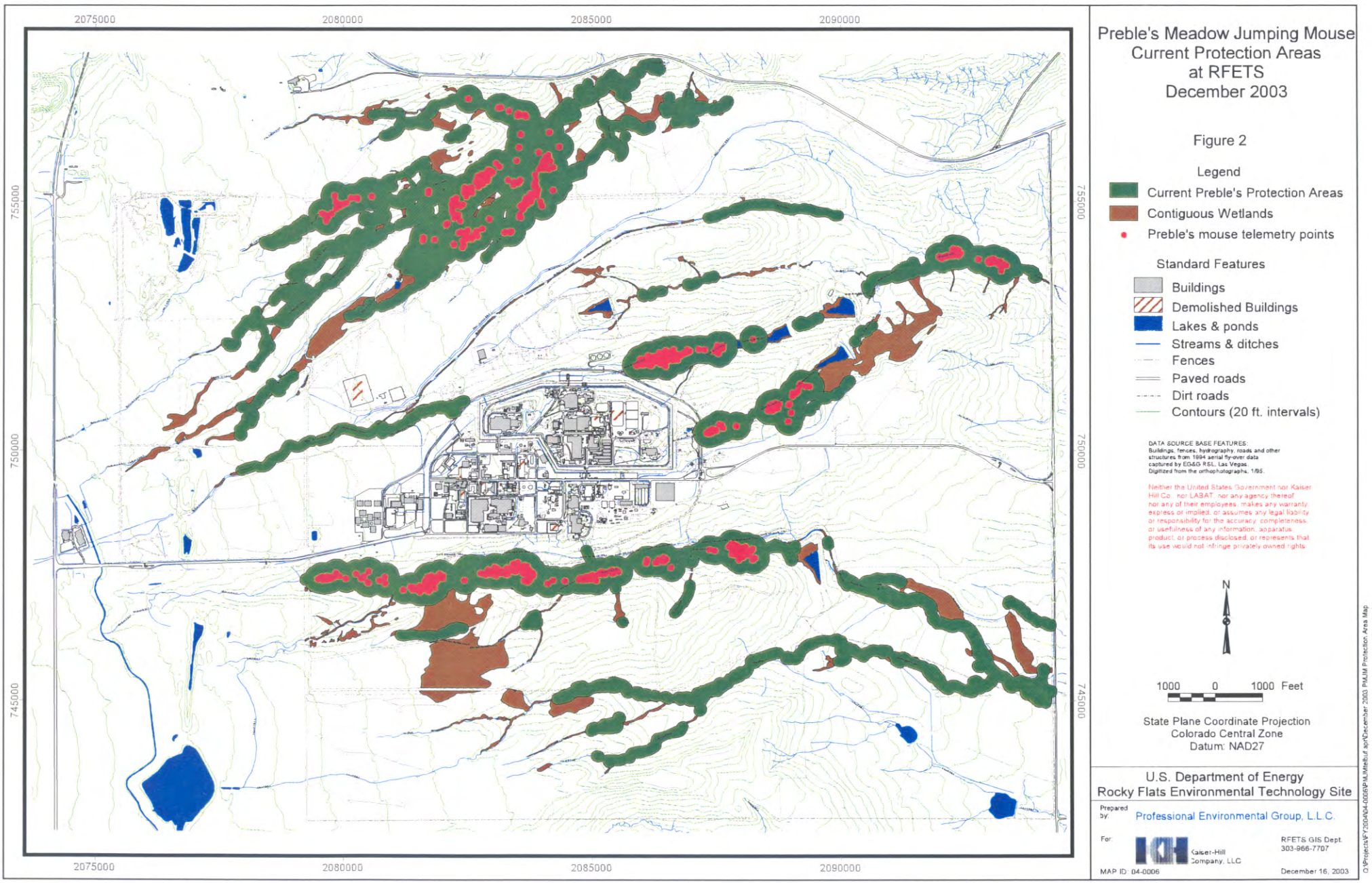
- Highways
- Major Roads
- Local Roads
- RailLines
- Streams and Gulches
- Lakes and Reservoirs
- County Boundaries
- Proposed Development

Miles

0 0.5 1 2

N

North Jeffco Area Group
Version 1.0, April 2002
8.5" x 11" Format
1:84,000 Scale
State Plane Coordinates
Central Zone, NAD 1927
For reference only.
Locations are approximate.



Preble's Meadow Jumping Mouse Current Protection Areas at RFETS December 2003

Figure 2

Legend

- Current Preble's Protection Areas
- Contiguous Wetlands
- Preble's mouse telemetry points

Standard Features

- Buildings
- Demolished Buildings
- Lakes & ponds
- Streams & ditches
- Fences
- Paved roads
- Dirt roads
- Contours (20 ft. intervals)

DATA SOURCE BASE FEATURES:
Buildings, fences, hydrography, roads and other structures from 1994 aerial fly-over data captured by EG&G RSL, Las Vegas.
Digitized from the orthophotographs, 1/95.

N

1000 0 1000 Feet

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by: Professional Environmental Group, L.L.C.

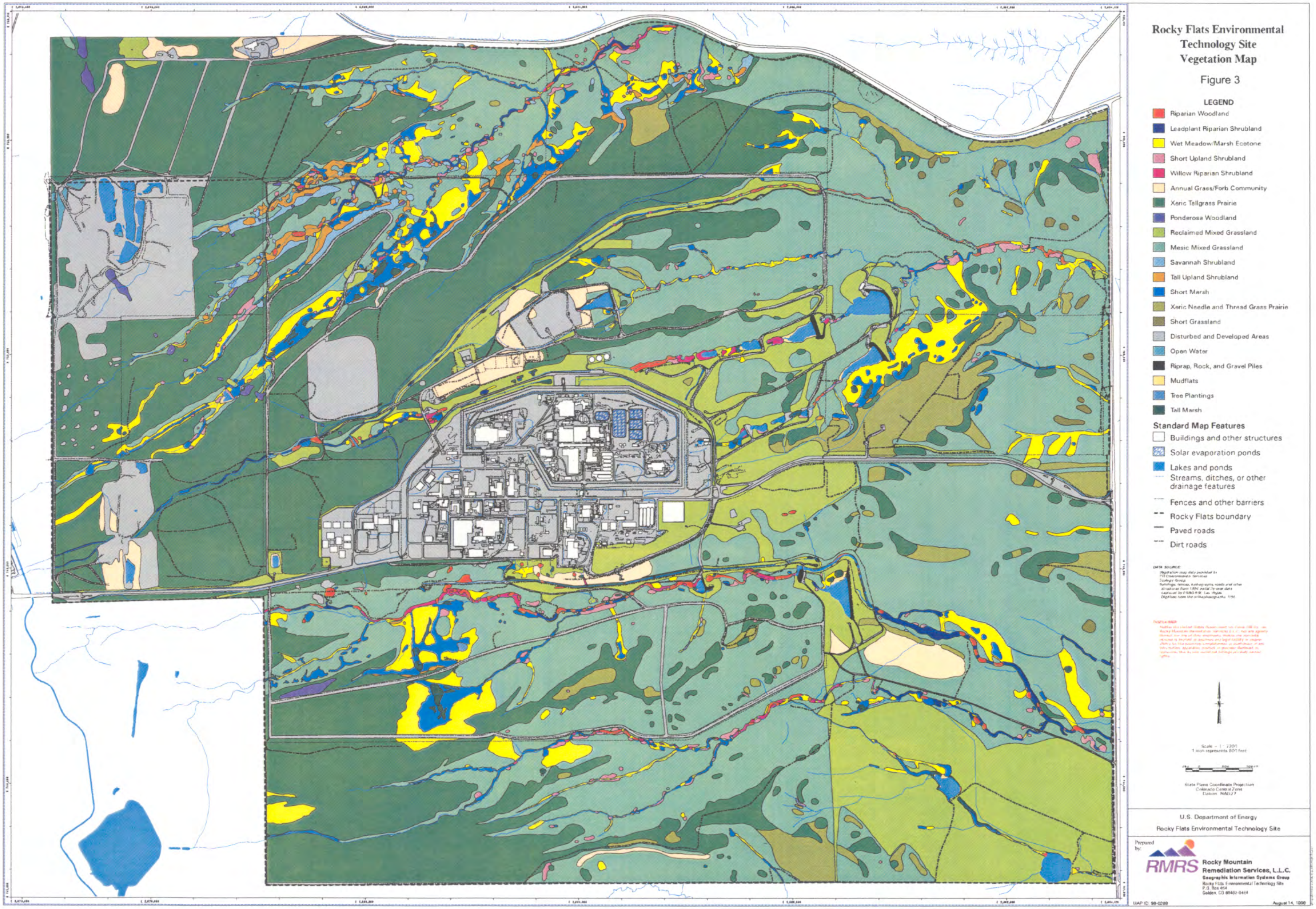
For: Kaiser-Hill Company, LLC

RFETS GIS Dept.
303-966-7707

MAP ID: 04-0006

December 16, 2003

O:\Projects\FY2004\04-0006\PMJM\Mxd\Jpg\December 2003 PMJM Protection Area Map


Rocky Flats Environmental Technology Site
Vegetation Map
Figure 3
LEGEND
Riparian Woodland
Leadplant Riparian Shrubland
Wet Meadow/Marsh Ecotone
Short Upland Shrubland
Willow Riparian Shrubland
Annual Grass/Forb Community
Xeric Tallgrass Prairie
Ponderosa Woodland
Reclaimed Mixed Grassland
Mesic Mixed Grassland
Savannah Shrubland
Tall Upland Shrubland
Short Marsh
Xeric Needle and Thread Grass Prairie
Short Grassland
Disturbed and Developed Areas
Open Water
Riprap, Rock, and Gravel Piles
Mudflats
Tree Plantings
Tall Marsh
Standard Map Features
Buildings and other structures
Solar evaporation ponds
Lakes and ponds
Streams, ditches, or other drainage features
Fences and other barriers
Rocky Flats boundary
Paved roads
Dirt roads
DATA SOURCE:
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD27
U.S. Department of Energy
Rocky Flats Environmental Technology Site
Prepared by:
RMRS
Rocky Mountain Remediation Services, L.L.C.
Geographic Information Systems Group
Rocky Flats Environmental Technology Site
P.O. Box 464
Golden, CO 80402-0464
August 14, 1998

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Contents

List of Figures

Acronyms and Abbreviations

AF	Acre Feet
BA	Biological Assessment
BE	Biological Evaluation
BMP	Best Management Practice
BO	Biological Opinion
BZ	Buffer Zone
CDNR	Colorado Department of Natural Resources
CDOW	Colorado Division of Wildlife
CDPHE	Colorado Department of Public Health and Environment
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
DOE	U.S. Department of Energy
EPA	Environmental Protection Agency
ESA	Endangered Species Act
GIS	Geographic Information System
IA	Industrial Area
IHSS	Individual Hazardous Substance Site
MOA	Memorandum of Agreement
NREL	National Renewable Energy Lab
PBA	Programmatic Biological Assessment
PPP	Preble's Protection Plan
PRCA	Platte River Cooperative Agreement
RFETS	Rocky Flats Environmental Technology Site
RFCA	Rocky Flats Cleanup Agreement
SID	South Interceptor Ditch
SOP	Standard Operating Protocol
SWWB	Site Wide Water Balance Report
USFWS	U.S. Fish and Wildlife Service
WWTP	Waste Water Treatment Plant

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1. Introduction

1.1 Purpose

The Department of Energy (DOE) developed this Programmatic Biological Assessment (PBA) for the Rocky Flats Environmental Technology Site (Site, RFETS) as part of the Section 7 consultation requirements of the Endangered Species Act of 1973, as amended (ESA). The DOE is the action agency requesting the formal consultation with the U.S. Fish and Wildlife Service (USFWS). This document is Part II of two parts of the PBA that will address the potential for Site activities to affect threatened and endangered species that are protected under the ESA. Part I of the PBA was prepared to examine impacts from routine, ongoing activities, and specific closure actions that will have either "no effect" or "may affect, but are not likely to adversely affect" listed species under consideration in this PBA. One listed species under consideration in this PBA includes the Preble's meadow jumping mouse (Preble's mouse, *Zapus hudsonius preblei*) and its habitat (current protection areas at the Site. Part II of the PBA addresses actions that are "likely to adversely affect" the species under consideration in this PBA or the Preble's mouse or its habitat. The current Preble's protection areas at the Site are defined as the areas delineated by the *Preble's Meadow Jumping Mouse Protection Plan* for the Site (PPP; DOE 2000; see Appendix A of Part I of this PBA for the Plan and the map). This plan was required under the Memorandum of Agreement (MOA, February 26, 1999) signed between DOE, USFWS, U.S. Environmental Protection Agency (EPA), Colorado Department of Public Health and Environment (CDPH&E), and the Colorado Department of Natural Resources (CDNR). The PPP was developed based on several years of Preble's mouse trapping, telemetry, and habitat characterization work at the Site. The PPP has been submitted several times to the USFWS for concurrence, however, the USFWS has never concurred. Although the PPP has never received formal concurrence, it has been cited and used for numerous Biological Assessments (BAs), Biological Evaluations (BEs), and Biological Opinions (BOs) for Site projects with no objections from the USFWS.

See Part I of the PBA for background and introductory information on the Site.

1.2 Assumptions

This PBA addresses all the potential activities that may occur at the Site through closure that may adversely affect threatened and endangered species, with specific emphasis on the Preble's mouse. However, the fact that a project is listed in this document does not necessarily mean that it will take place. Only projects that are conducted will be mitigated as discussed in the PBA. Mitigation will not occur for projects that are not conducted. The objective of the PBA is to identify all potential projects for the consultation process so that no delays in project schedules will occur.

1.3 Responsibilities

To ensure compliance with the requirements of Part II of the PBA and BO the following guidelines are established:

1. Project managers for projects addressed in Part II will be given a copy of the PBA and BO and instructed on the requirements contained therein related to their projects.
2. Initial project boundaries agreed upon in the PBA will be physically delineated on the ground by Site ecologists and/or the USFWS. Flagging, plastic fencing or other means will be used by the project to delineate the project boundary. The project will be advised that all work and storage areas must be conducted and contained within this boundary.
3. Site ecologists and/or USFWS personnel will meet regularly with project personnel to discuss and ensure PBA and BO requirements are being followed. Meetings and project location visits will be documented.
4. Should projects require additional area, the USFWS will be consulted.
5. In situations, where the project does not disturb the entire area originally designated for disturbance, the area actually disturbed will be delineated and mapped, acreage calculated, and that area used to determine the actual amount of mitigation needed (if any) based on the mitigation ratios agreed on in the PBA. Within current Preble's protection areas, open water, riprap, concrete, roads, and structures are not considered Preble's habitat. Therefore if these areas are removed during the project, and revegetated, they will be considered as habitat creation. The created habitat will be delineated and mapped, acreage calculated, and that area taken as credit to offset debits. This information will be reported to the USFWS.

1.4 Species Considered In This Assessment

Based on a species list received from the USFWS the following species have been evaluated as part of this PBA. Species descriptions are presented in Appendix B of Part I of this PBA.

Animals	**Legal Status**
American burying beetle (*Nicrophorus americanus*)*	LE
Bald eagle (*Haliaeetus leucocephalus*)	LT
Black-footed ferret (*Mustela nigripes*)	LE
Black-tailed prairie dog (*Cynomys ludovicianus*)	C
Boreal toad (*Bufo boreas boreas*)	C
Canada lynx (*Lynx canadensis*)	LT
Eskimo curlew (*Numenius borealis*)*	LE
Greenback cutthroat trout (*Oncorhynchus clarki stomias*)	LT
Least tern (*Sterna antillarum*)*	LE
Mexican spotted owl (*Strix occidentalis lucida*)	LT
Mountain plover (*Charadrius montanus*)	PT
Pallid sturgeon (*Scaphirhynchus albus*)*	LT
Pawnee montane skipper (*Hesperia leonardus montana*)	LT
Piping plover (*Charadrius melodus*)*	LT
Preble's meadow jumping mouse (*Zapus hudsonius preblei*)	LT
Whooping crane (*Grus americana*)*	LE
Plants	
Colorado butterfly plant (*Gaura neomexicana coloradensis*)	LT
Ute ladies'-tresses (*Spiranthes diluvialis*)	LT
Western prairie fringed orchid (*Platanthera praeclara*)*	LT

* = Lower Platte River species
C = Candidate for listing
LT = Listed threatened
LE = Listed endangered
PT = Proposed threatened

2. Likely To Adversely Affect Activities

This section of Part II of the PBA outlines various Site activities that are "likely to adversely affect" listed species. Although several species are under evaluation, the activities will only likely affect the Preble's mouse. Preble's mouse "take", as defined by the USFWS, would likely occur as a result of these project activities. In the USFWS Endangered Species Consultation Handbook (USFWS 1998), "take" is defined as:

"to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect or attempt to engage in any such conduct. [ESA §3(19)] Harm is further defined by the FWS to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as breeding, feeding, or sheltering. Harass is defined by FWS as actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. [50 CFR §17.3]"

These project activities were deemed likely to affect or cause "take" to the Preble's mouse because the projects described in Part II of the PBA exceed the criteria listed in Part I of the PBA that would result in a "no effect" or "may affect, but not likely to adversely affect" determination. The flowchart in Figure 1 summarizes the above criteria and allows for easier determination of project activity effects.

To minimize impacts to the Preble's mouse, project management will utilize and maintain the following best management practices (BMPs) except where regulatory and/or health and safety requirements take precedence.

- Identify and prioritize Preble's habitat areas that are subject to disturbance and design activities to avoid areas of higher habitat value[1]. For example, large willow patches will be avoided, except where the project cannot be completed without impacts.
- Reduce the impact footprint (i.e., no excessive walking in area beyond what is necessary to accomplish the work, minimizing laydown area and equipment storage locations).
- Conduct all activities during daylight hours, when the Preble's mouse is less active, when scheduling during the hibernation season of the mouse cannot be accomplished.
- Minimize the length of time spent in sensitive areas (getting work done as quickly as possible, not reentering area once work is completed).

[1] For determination of impacts within current Preble's protection areas, habitat quality was defined based on the 1996 Site vegetation map. Higher quality habitat is defined as all woody vegetation classifications and short marsh, tall marsh, and wet meadow wetland types. Lower quality habitat is defined as all grassland classifications, mud flats, and other disturbed community types. Open water, riprap, concrete, roads, and structures are not considered habitat for the Preble's mouse.

- Explore options with project designers to avoid and/or minimize impacts to the Preble's mouse.
- Use established roads (i.e. paved, gravel, two-track, historically used routes to monitoring locations) for vehicle traffic. If an established road does not exist, use the safest and most direct route that minimizes impacts to the habitat.
- Limit equipment entrance/exit areas to the minimum necessary to accomplish the work.
- Limit vegetation disturbance through alternative actions. For example, prune trees/shrubs rather than remove trees/shrubs; cut shrub stems to allow re-growth rather than grubbing out the entire root system.
- Remove trash and unnecessary equipment in project areas after work is completed.
- Revegetate disturbed Preble's habitat with native species after the activity has been completed in accordance with the Habitat Mitigation Techniques Plan (Appendix A, Part II of PBA).
- When revegetation activities cannot be completed immediately after project completion (i.e., outside optimum seeding window) use alternative erosion controls to control potential erosion and sedimentation problems. Use redundant erosion controls where appropriate.
- Use erosion controls (i.e., silt fence, erosion blankets, hay bales, mulching, tackifiers, surface roughening) to control erosion and sedimentation problems. For large areas, minimize exposed surfaces. Project personnel will be responsible to monitor erosion control effectiveness and modify control techniques as needed (especially after precipitation events). Monitoring will be conducted weekly or more frequently as needed (after precipitation events). Projects will maintain and repair erosion controls through project completion.
- Monitoring of mitigation actions will be conducted according to the Mitigation Monitoring Plan (Appendix B of Part II of the PBA)
- Prevent spilled fuels, lubricants or other toxic materials from entering Preble's habitat.
- Minimize project activities in wet areas and wet conditions to avoid damage to the habitat.
- Use the least amount of and/or smallest equipment necessary to accomplish the work.
- Do not clean equipment in Preble's mouse habitat or in areas where runoff will enter Preble's mouse habitat.
- Staging areas will be located either outside of Preble's habitat, or within the defined project footprint.
- Preble's mouse habitat will not be used as borrow areas.
- Inspect and clean equipment of weeds/seed to prevent spread of noxious weeds.

Project managers will receive a copy of Part II of the PBA and BO, and be briefed on the guidelines and requirements contained therein pertinent to their project. Project management is responsible to ensure compliance with the requirements and guidelines outlined in Part II of the PBA and BO. Project managers are responsible for following and maintaining the best management practices (BMPs).

The following table lists the projects that are likely to adversely affect the Preble's mouse and its habitat. Figure 2 shows the general locations of the projects. The table summarizes the project impacts within the current Preble's protection areas and whether the project will be conducted primarily during the hibernation period of the mouse. Replacement of open water areas with vegetated communities is considered creating habitat and offsets the overall total impact of project activities. Additional detail on each project is found following the table. Project evaluations are based on worst case scenarios, except where specific plans or information currently exists. The activities included in this section are being consulted on because they are likely to happen. Their inclusion here, however, does not constitute the fact that they will indeed occur. The timeframe for completion of all the projects listed in Part II of the PBA is December 2006.

For determination of impacts to Preble's habitat, habitat quality was defined based on the 1996 Site vegetation map that was used to produce the current Preble's protection plan map. Using the Site's GIS, project footprints and the current Preble's protection area GIS coverages were overlain to determine the amount of area specific projects might impact in Preble's habitat. With this determined, the 1996 vegetation map was used to identify the different plant communities or habitat types within the potentially impacted Preble's habitat. Higher quality habitat is defined as all woody vegetation classifications and short marsh, tall marsh, and wet meadow wetland types. Lower quality habitat is defined as all grassland classifications, mud flats, and other disturbed community types. Open water, riprap, concrete, roads, and structures are not considered habitat for the Preble's mouse. This information was used in the GIS to calculate the total number of acres of potential temporary and permanent impacts to both lower and higher quality habitat within the project footprints.

Project	Temporary (Acres)		Permanent (Acres)		Total Disturbance (Acres)
	Habitat Quality*		Habitat Quality*		
	Lower	**Higher**	**Lower**	**Higher**	
Monitoring Well Installations	0.00	0.09	0.00	0.003	0.093
Original Landfill Project	6.34	2.76	0.00	0.00	9.10
Pond Remediation and Removal					
A-Series	11.50	3.07	0.00	0.25	14.82
B-Series	10.48	1.78	0.00	0.33	12.59
C-Series	6.65	2.05	0.98	0.31	9.99
Total	28.63	6.90	0.98	0.89	37.40
Surface Water Monitoring Equipment Removal	0.00	1.00	0.00	0.00	1.00
Surface Water Permanent Flume Installations and Replacements	0.00	0.50	0.00	0.00	0.50
Surface Water Flume Removal	0.00	0.55	0.00	0.00	0.55
North Access Road and Culvert Removal Project	2.23	0.43	0.00	0.00	2.66
Dam Maintenance and Safety Activities	0.00	0.00	3.16	0.22	3.38
Waste Water Treatment Plant	0.00	0.00	0.00	0.00	0.00
Site Water Reduction	N/A	N/A	N/A	N/A	N/A
Unforeseen Projects	0.00	1.75	0.00	0.25	2.00
Total Disturbance	**37.20**	**13.98**	**4.14**	**1.36**	**56.68**

* See footnote number one for definitions of habitat quality.

3. Projects

This section describes the projects that are likely to occur through Site closure and that will adversely affect listed species (i.e. the Preble's mouse). A number of assumptions have been made to allow the development of this PBA without having detailed plans for each of the projects listed below. The assumptions are provided below.

Project boundaries have been estimated based on the best current available information. Worst case scenarios have been assumed for the following project descriptions. Should larger areas than specified in the PBA be required, additional consultation with the USFWS will be conducted. Preble's mouse data from the Site and elsewhere have been used as the best scientific information for making decisions. Acreages of disturbance to the current Preble's protection area were determined using the Site's Geographic Information System (GIS). This PBA attempts to identify all potential projects that could occur within the current Preble's protection areas. However, given the scope and scale of the closure activities, it is possible something could have been missed and that additional consultation will be required. The activities listed in this section are being consulted on because they may happen. Their listing here, however, does not obligate them to occur. But should they occur, these activities will be covered under the PBA.

3.1 Monitoring Well Installations

Monitoring wells may still need to be installed at different locations across the Site to monitor possible contaminants in the groundwater. Wells are required to be installed to meet regulatory requirements for water quality at the Site. Typically these wells are installed next to buildings and other structures that are in the process of being removed in order to monitor potential contamination during and after closure activities. These buildings and structures, and therefore the wells, are usually located within the IA, outside of Preble's habitat. Occasionally, however, wells are installed in the Buffer Zone (BZ) in the Preble's mouse current protection areas. It is estimated that prior to Site closure about ten additional monitoring wells may need to be installed that will fall within Preble's mouse habitat. Currently no definite plans or locations for wells are available.

The activities typically involved in the installation of a well are as follows. A truck-mounted drill rig is driven to the well location and used to bore the well holes. The excavated soil from the well boring (typically one cubic yard) is spread thinly throughout the work area to avoid burying vegetation. This follows the Rocky Flats Cleanup Agreement (RFCA) Standard Operating Protocol (SOP) for Asphalt and Soil Management for the Site (K-H 2001a, Appendix C of Part II of PBA). For the well installations, it is estimated that 405 square feet will be disturbed for each well. This footprint area will be used for the drill rig, the actual drilling location, and the staging area for other equipment that will be needed during the process. The excavated soil from

the well boring will be spread within this 405 square feet or scattered so thinly outside the area that little to no disturbance would be created by it. Of these 405 square feet, 13 square feet (the approximate size of the concrete pad) will be permanently disturbed. The total temporary habitat disturbance for all ten of the proposed well installations is about 3,920 square feet (or about 0.09 acres). The total permanent loss for this project is estimated to be about 130 square feet (about 0.003 acres). All impacts are calculated based on the assumption that they would occur in higher quality habitat. Best management practices will be used to minimize impact to the Preble's mouse or its habitat. Revegetation of soil disturbances will follow the revegetation plan provided in Appendix A of Part II of the PBA.

No description of Preble's habitat or quality of habitat can be provided at this time because no known locations for wells installations have been determined. As mentioned above, a small amount of permanent habitat loss will occur (13 square feet/well) with the remainder being temporary loss only. Some temporary indirect impact from noise and human presence is likely to result from the drill rig. No impacts to water flows or increased sedimentation are expected. Depending on the location of where the well must be installed, there could be off-road driving within the Preble's habitat areas. This will be minimized as much as possible. After the wells are installed, periodic monitoring will be required to collect samples for analysis. These monitoring activities will be conducted as described in Part I of the PBA. As a result, if the well is located off existing roads, a two-track road will likely be created for access to the well.

Some "take" is likely as a result of the project because of the potential to harm or harass the Preble's mouse because a drill rig will be used and other disturbance to the habitat will occur. However, the effect to the Preble's mouse will be primarily a temporary loss of habitat, if and when these wells are actually installed. Further discussion on the effects to the Preble's mouse is presented in the Analysis of Impacts section of Part II of the PBA. If more than ten wells must be installed within Preble's habitat prior to Site closure, re-initiation of consultation with the USFWS will be undertaken.

3.2 Original Landfill Project

The Original Landfill is located in the BZ south of the IA on a south-facing hill slope north of Woman Creek (Figure 2). The Original Landfill has an area extent of approximately 20 acres and includes two Individual Hazardous Substance Sites (IHSS): the Original Landfill (IHSS 115), and the Filter Backwash Pond (IHSS 196). The water treatment plant Filter Backwash Pond overlies the landfill in the western part of the Original Landfill site. In addition to the Original Landfill and Filter Backwash Pond, the site includes a number of other disturbed areas and structures, such as the South Interceptor Ditch (SID), which will be destroyed during the project activities. The SID will not be rebuilt. Cleanup of the Original Landfill is being conducted as a Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) action under the requirements of RFCA.

The basic plan for remediation of the Original Landfill project involves removing any radiological hotspots and stabilizing the hillside slopes to prevent further erosion. Cleanup, if conducted, will be required for regulatory purposes. The project may potentially disturb an area several hundred feet long along Woman Creek (Figure 2). The total amount of disturbance along Woman Creek will depend on the final design plan, which may or may not require some type of buttress wall at the base of the hill to stabilize the slope. The worst case scenario is outlined here for purposes of the PBA and includes the area that would potentially be disturbed by this latter activity. In the long-term, however, cleanup and stabilization of the hillside should reduce the potential for future contamination of Woman Creek and reduce the need to disturb the area again.

Most of the habitat north of the stream that may be disturbed is part of an old dump (landfill) that is largely vegetated with reclamation grasses (smooth brome [*B. inermis*] and intermediate wheatgrass [*A. intermedium*]) and noxious weeds (diffuse knapweed [*Centaurea diffusa*]). Some coyote willow (*Salix exigua*) and young plains cottonwood (*Populus deltoides*) trees are found occasionally on the hillside above the South Interceptor Ditch (SID) or in the SID itself. Plains cottonwood trees, coyote willow, and false indigo (*Amorpha fruticosa*), are found along the main channel of Woman Creek itself on the southern edge of the project area and extend upstream and downstream of the project area, undisturbed, for several hundred feet in each direction. Currently large areas on the hillside are exposed to erosion due to the steepness of the slopes. The area along the stream itself along the southern edge of the project area is known to be occupied by the Preble's mouse based on past studies in Woman Creek. The riparian corridor at this location, however, is wider than at other locations in Woman Creek because years ago, a diversion channel was dug south of the natural stream channel to divert water away from the Original Landfill to prevent undercutting of the hillside. As a result, the riparian corridor is somewhat wider and additional habitat is available on the south side of the stream at this location.

A total of 9.10 acres of current Preble's protection area may be disturbed as a result of this project. Of this acreage, 6.34 acres are lower quality habitat and 2.76 acres are higher quality habitat. The higher quality habitat includes the riparian woody vegetation area on the north edge of Woman Creek within the project area. The disturbance will all be temporary, in that after the project is completed the disturbed areas will be revegetated with native species. Heavy earthmoving equipment will be used to conduct the project. This could include such equipment as backhoes, trackhoes, dump trucks, scrapers, bulldozers, or other large pieces of earthmoving type equipment. Large areas of the hillside have the potential to be scraped off and recontoured with addition fill material. This potentially includes all the area within the project boundary (Figure 2). These activities may be required to reduce the potential for soil erosion that exists due to the steep slopes currently present on the hill. Silt fence and other best management practices will be used to keep disturbance out of the actual stream and riparian community along the stream edge. Redundant erosion controls may be used where appropriate and necessary. Project personnel will conduct weekly inspections of erosion controls (more

frequently after precipitation events) and maintain and make repairs as necessary through project completion.

The duration of this project may be several months. Although the habitat on the north side of the stream will be temporarily destroyed, suitable habitat south of the stream will remain intact and not be disturbed. Additionally several hundred feet of higher quality riparian habitat exists upstream and downstream of the project area for the Preble's mice. No effect to travel corridors should occur as a result of the project at this location. There may be some impacts from noise resulting from the heavy equipment and human presence. No alteration of stream flows or increased sedimentation is expected with appropriate and redundant use of erosion control measures. Should alteration of stream flows be needed and/or if sedimentation occurs in the riparian habitat, the USFWS will be consulted.

Once the project is completed, the area will be revegetated with native plant species following the guidance provided in the habitat mitigation techniques and monitoring plan documents provided in Appendices A and B of Part II of the PBA. It is likely to take a growing season to establish a stand of vegetation cover on the disturbed areas. Best management practices will be used to minimize impact to the Preble's mouse and/or its habitat.

"Take" is likely as a result of the project because of the potential to harm or harass the Preble's mouse. The large scale earthmoving activities using heavy earthmoving equipment have the potential to harm and harass the mouse, in addition to direct "take" of Preble's mice. Indirect effects may include noise, dust, and potentially erosion or sedimentation along the stream. Best management practices will be used to minimize these potential impacts. The largest effect to the Preble's mouse, however, will be a temporary loss of lower quality grassland on the hillside areas north of Woman Creek. Some impact to the woody riparian vegetation may occur along the north side of the stream depending how close the project must get to the stream edge. This worst case scenario assumes that all the riparian vegetation along the Woman Creek within the construction area (Figure 2) will be removed. Coyote willow and other shrubby vegetation along Woman Creek that will be disturbed during project activities will be cut at ground level prior to Preble's mouse hibernation, depending on the time of year. This will discourage the mice from hibernating within the project area. Cutting the vegetation at ground level will leave the roots in tact, and if the rootstock remains undisturbed during project activities, this will allow for immediate resprouting of the species from underground rootstock. Further discussion on the effects to the Preble's mouse is presented in the Analysis of Impacts section of Part II of the PBA.

3.3 Pond Remediation and Removal

As part of the Site cleanup and closure, several of the ponds in the A-series, B-series, and C-Series may be remediated as necessary (Figure 2). Some ponds may also be removed or modified. The ponds included in this assessment are the A-1, A-2, A-3, B-1, B-2, B-3,

B-4, C-1, C-2 ponds and associated diversion and bypass structures found near the C-2 pond in Woman Creek. In addition, as necessary, the project may remove the associated underground pipelines and valve boxes that are used to transfer water from one pond to another. These pipelines are typically buried adjacent to the pond edges and run between the ponds. Characterization of pond sediments may be conducted prior to remediation activities to characterize the need for remeditaion. Characterization involves sampling the sediments on the pond bottoms by foot or in a boat. Remediation activities would include removal of contaminated sediments from the pond bottoms and stream channels, and shipment to off-Site approved storage or disposal facilities. Pond removal activities may include removal of the dams and spillway structures, recontouring of the natural stream drainage and channel, and revegetation with native plant species. Removal may also include breaching of the dams or leaving some type of lowhead dam structure in place to maintain the wetlands in place behind the dams (Figure 3). Note: If the dams are not removed prior to Site closure, then dam maintenance activities will continue indefinitely.

At the C-2 pond location, the Woman Creek bypass structure and diversion ditch that routes water from the natural stream channel around the C-2 pond may be removed. The large riprap and concrete bypass structure in the creek channel above the C-2 pond may be taken out and the natural stream channel reestablished to allow the stream to flow into C-2. The diversion ditch may be filled in and recontoured to match the natural landscape. The outlet works for the C-2 pond were designed incorrectly and need repair. Currently the water from the pond must be pumped through a pipeline over the dam. In order to fix this problem, upgrades may also be made to the C-2 pond outlets works so that they are able to properly function and allow for releases of water from the pond. If the bypass structure and diversion ditch are not removed, repairs to riprap drop structures in the diversion ditch will be necessary to prevent further erosion of the ditch. In either case, however, the project will remain within the assumed project boundary. Any need to exceed this would require additional consultation with the USFWS prior to project initiation.

For the purposes of the PBA, the worst case scenario is assumed which involves the complete removal of ponds and restoration of the stream channels at the locations of all the interior ponds and associated structures listed above. The assumption is that the entire area within the proposed construction area around the ponds shown in Figure 2 will be disturbed and the current habitat converted to bare ground before revegetation would occur. Heavy equipment would be required for the pond remediation or removal activities. This may includes equipment such as trackhoes, backhoes, front end loaders, dump trucks, scrapers, bulldozers, or other similar type equipment. Staging areas will be located within previously disturbed areas or outside Preble's habitat. Attempts will be made to minimize the overall extent of the disturbance footprint within the Preble's habitat. Redundant erosion controls will be used where appropriate and necessary to prevent erosion and sedimentation in the streams. Project personnel will conduct weekly inspections of erosion controls (more frequently after precipitation events) and maintain and make repairs as necessary through project completion.

In the A-series, B-series, and C-series pond areas, the ponds are surrounded typically by short and tall marsh habitats along the pond edges and grassland in the surrounding upland areas. At some locations upstream and downstream of the ponds and dams themselves, coyote willow, plains cottonwood, and false indigo are common. Preble's mice have been captured in the A-series ponds above the A-3 pond, in the B-series ponds above the B-5 pond, and in the C-series ponds above and below the C-1 pond, between the C-1 and C-2 ponds, but not below the C-2 pond or in the diversion ditch around C-2. Previous trapping and telemetry studies have documented the use of these latter areas by the Preble's mouse at the Site.

In the A-series ponds a total of 14.82 acres of current Preble's habitat could be disturbed (Figure 2). Of this approximately 0.25 acres may be lost permanently if the dams are breached (loss occurring in breach location). In the B-series ponds a total of 12.59 acres of current Preble's habitat could be disturbed (Figure 2), with approximately 0.33 acres being permanent. In the C-series ponds, a total of 9.99 acres of current Preble's habitat could be disturbed (Figure 2), with up to 1.29 acres being permanent. In the C-series, most of the work in the C-2 pond area would create temporary disturbances, however, about 1.08 acres in current Preble's protection areas would be a permanent loss because of the loss of the bypass channel (assuming the scenario where the bypass channel and diversion ditch are filled in). Note: for all calculations the surface area of the ponds has been subtracted from the total disturbance because the water surface is not suitable Preble's habitat. As a result, when these open water areas are converted to Preble's habitat, a net increase of 2.65 acres of higher quality habitat is expected. Additional discussion about the creation of Preble's habitat is found in the mitgation section of Part II of the PBA.

Removal and remediation of the ponds may completely disturb the riparian corridors at the pond locations. Although no schedule is currently available for the projects, the pond removal and remediation activities may take several months to accomplish. Best management practices will be used to minimize potential impacts to the current Preble's protection areas. Project plans would be evaluated to minimize construction footprints in Preble's habitat. However, the habitat adjacent to the ponds will likely be destroyed and taken to bare ground as part of the earthmoving and stream corridor reestablishment activities, in addition to human presence during the project. Travel corridors for the mice may be disrupted, direct "take" is possible as a result of the earthmoving activities and heavy equipment. Noise, dust, erosion, and sedimentation are potential additional indirect factors that may affect the mice in surrounding areas. Redirection of stream flows during the project are likely in order to de-water the ponds so that remediation and restoration activities can proceed. Revegetation of the disturbances will be conducted following the guidance documents found in Appendices A and B of Part II of the PBA. "Take" is likely as a result of the project because of the potential direct and indirect factors that may harm or harass the Preble's mouse. Further discussion on the effects to the Preble's mouse is presented in the Analysis of Impacts section of Part II of the PBA.

The creation of Preble's habitat is discussed further in the mitigation section of Part II of the PBA.

3.4 Surface Water Monitoring Equipment Removal

Several old surface water monitoring stations and associated equipment are scattered along the streams in Walnut Creek and Woman Creek at many locations. These structures include old monitoring instrumentation housings, concrete pads, posts, and signage. Most of these structures and equipment will likely be removed as part of the Site cleanup and closure. All these structures are located within the current Preble's protection areas. The vegetation varies depending on location. At some locations, coyote willow and other shrubs have overgrown the old equipment. At other locations, only herbaceous vegetation is present. Depending on the specific location in the drainage there may or may not be Preble's mice present, based on past trapping data. Existing roads or tracks access most of these locations. Some clipping of shrubs may be necessary to access and remove the equipment. Because some of the equipment is buried in the ground, removal will likely require some minor excavation or in some cases wooden posts may be cut off at ground level. Heavy equipment (backhoe, trackhoe, or front end loader) may be needed to remove the larger structures. Existing roads will be used as much as, possible, however, some off-road travel may be necessary to access the equipment. Access routes will be minimized to prevent damage to the habitat. A maximum of one acre of temporary disturbance in the current Preble's protection areas is estimated to be potentially disturbed across the Site where this equipment is to be removed. As a conservative approach, all impacts are assumed to occur in higher quality habitat. If more than one acre will be disturbed, consultation with the USFWS will be reinitiated. Monitoring and delineation of the size of disturbances created by this project will be conducted by Site ecologists and/or USFWS personnel.

Some "take" could result from this project because of the potential to harm or harass the Preble's mouse along stream reaches where the mouse is found. Indirect effects may include noise, dust, and potential erosion or sedimentation along the stream. Disturbance to the vegetation and the need for some excavation pose the greatest potential to harm or harass the mouse. Best management practices will be used to minimize these potential impacts to the current Preble's protection areas. Project plans would be evaluated to minimize construction footprints in Preble's habitat. Revegetation of disturbances would take place after completion of the project using native plant species and following the methods outlined in Appendices A and B of Part II of the PBA.

3.5 Surface Water Permanent Flume Installations and Replacement

Surface water flumes are used at the Site to monitor water flows and for automated grab samples for contaminant analyses. The permanent flumes are large concrete structures that require the use of heavy equipment and take several weeks to complete the construction activities. (Note: temporary flume installations are discussed in Part I of the PBA). In 2002/early 2003, two permanent surface water flumes were replaced at the Site because of their deteriorated condition. These flume replacement projects were

determined to adversely impact the Preble's mouse because of the scope and scale of the project and the need for heavy equipment to complete the project. A biological assessment was written and submitted to the USFWS for approval (DOE 2002). The USFWS gave approval for the project in a biological opinion (USFWS 2002, Appendix D of Part II of the PBA).

Although currently there are no plans to add or replace permanent flumes at the Site prior to closure, if any were to be replaced the work would be conducted in the same fashion as those previously approved. For the PBA it is assumed that one additional flume may be replaced between now and closure. The total area of disturbance would be 0.5 acres. It would all be temporary disturbance since the flume footprint would be the same size as being replaced. As a conservative approach, all impacts are assumed to occur in higher quality habitat. Some "take" would be likely as a result of the project because of the potential to harm or harass the Preble's mouse along the streams since heavy equipment and excavation would be necessary. Depending on the specific location in the drainage there may or may not be Preble's mice present, based on past trapping data. Trackhoes, backhoes, or front end loaders, in addition to other types of equipment may be required to complete the work. The type and quality of habitat that could be disturbed may vary depending on the location chosen for the project. It could range from a herbaceous wetland habitat type to a woodland/shrubland area. The duration of the project could vary from one to three months depending on weather conditions. Indirect effects may include noise, dust, and potentially erosion or sedimentation along the stream. Best management practices will be used to minimize potential impacts to the current Preble's protection areas, as was done during the recent projects. Project plans would be evaluated to minimize construction footprints in Preble's habitat. Revegetation of project areas would be conducted after completion of the project using native plant species and would follow the basic guidance provided in the habitat mitigation techniques document provided in Appendix A in Part II of the PBA. Post-mitigation monitoring would be completed following the protocols provided in Appendix B in Part II of the PBA.

3.6 Surface Water Flume Removal

It may become necessary to remove some of the old surface water flumes located throughout the BZ before Site closure. These surface water flumes have been used at the Site to monitor water flows and for automated grab samples for contaminant analyses. Several flumes are no longer being used, or will be discontinued prior to Site closure. The flumes to be removed include both temporary and more permanent flumes (Figure 4). The two types differ in construction, and therefore removal of each type will be different. Both types of flumes have been monitored for years, so an established road exists next to most of them.

The temporary flumes are small structures (approximately 12x3 feet) that include a fiberglass body, plastic sheeting wings, and wooden beam and sand bag anchors. Currently ten temporary flumes are located within Preble's habitat that may be removed (Figure 4). If others are removed, the same removal methodology outlined here will be

followed. The removal of the temporary flumes involves dismantling the structure by hand and lifting the pieces into a vehicle to remove out of the area. Some trampling of the vegetation may occur with the removal of these temporary flumes. A total of 0.01 acres of temporary disturbance is expected for each flume for a grand total of 0.10 acres of disturbance. If additional temporary flumes are installed in Preble's habitat (Part I of PBA), they would be removed in the manner described here.

The permanent flumes are concrete structures that will require heavy equipment for removal. A piece of heavy equipment such as a trackhoe, backhoe, or similar type equipment may be driven to the flume and used to remove the flume and other associated structures. The structures will be lifted into a roll-off container or dump truck and hauled off-Site. The vegetation at these locations varies depending on location. Depending on the specific location in the drainage there may or may not be Preble's mice present, based on past trapping data. Disturbed areas will be contoured to match the surrounding areas. Revegetation of disturbances will be done using native plant species following the basic guidance provided in the habitat mitigation techniques document provided in Appendix A in Part II of the PBA. Indirect effects may include noise, dust, and potential erosion or sedimentation along the stream. Best management practices will be used to minimize these impacts and disturbance to the surrounding Preble's mouse habitat.

The following permanent flumes may be removed prior to closure: GS01, GS02, GS03, GS04, GS05, GS08, GS10, GS12, and SW093. It is estimated that a disturbance footprint for each flume will not exceed 2180 square feet (0.05 acres). This footprint will include any impact from heavy equipment, the roll-off, and other equipment used to remove the flumes. For all 9 permanent flumes the total acreage in the current Preble's protection areas would be about 0.45 acres. As a conservative approach, all impacts are assumed to occur in higher quality habitat.

Removal of the permanent flumes impacts the habitat less than installation of a flume because for removal a trackhoe or similar type piece of equipment will be driven to the flume, the flume will be lifted out and placed in a roll-off container for disposal. For a flume replacement or installation, additional area is necessary for equipment staging, preparation of the area to install the new flume, construction of concrete forms, pouring of the concrete, installing the new flume, and final contouring and revegetating of the project area. A flume removal disturbs a much smaller area and takes much less time compared to a flume installation or replacement. "Take" is likely as a result of the project because of the potential to harm or harass the Preble's mouse along the streams at the Site resulting from the use of heavy equipment and the excavation required for the project. Impacts would be temporary until the areas became revegetated.

3.7 North Access Road and Culvert Removal Project

As part of the IA regrading plan, the north access road and some of the culverts that occur in the IA are planned for removal. Most of the culvert removals will not be in current Preble's protection areas. However, along portions of the north access road where the

road crosses North Walnut Creek and South Walnut Creek (Figure 2), the road and culverts are planned to be removed. At these locations, only small work areas would be located in the current Preble's protection area. The area northeast of B771 contains higher quality riparian woodland/shrubland vegetation (coyote willow and plains cottonwood trees) where Preble's mice have been captured in the past. South of the 995 complex (sewage treatment plant), the habitat consists of grassland and cattails. Preble's mice have never been captured in this area (west of the North Access road). The area east of the North Access road consists of coyote willow along the stream before it enters the B-1 pond. Preble's mice have been captured in this location before. Northwest of B371, the project area along the road is largely cattails, with some coyote willow and occasional plains cottonwood trees around the perimeter. Trapping has never been conducted in this area, but it has been assumed there is a low probability of mice in this area because of the barrier to travel that was created by the north access road, large parking lots, and channelized stream.

In addition to road and culvert removal in Walnut Creek, approximately 12 old concrete culvert sections remain from a long abandoned road in the bottom of Woman Creek south of the Building 130. These may also be removed as part of the Site cleanup operations. The remaining culverts are located in the stream bottom of Woman Creek in Preble's mouse habitat. The culverts in Woman Creek would be lifted from the stream bottom using a crane or hoist of some type and placed on a truck and removed from the area. The vehicles used would access the area on a two-track road that accesses the location. A small amount of off road driving on the mesic grassland adjacent to the stream channel would be necessary to stage the crane or hoist. Other than some trampling of the vegetation and the need to walk into the shrubby vegetation where the culvert sections are located, little disturbance of the vegetation is expected. A total of 0.40 acres of lower quality habitat and 0.20 acres of higher quality habitat may be temporarily disturbed during this aspect of the project.

For the roads and culverts located in Walnut Creek, heavy earthmoving equipment (trackhoes, backhoes, front-end loaders, scrapers, or other similar type of equipment) will be used for the removal activities. Although much of the activity would be conducted from the road and shoulder areas on the roads themselves, which are not considered Preble's habitat, some disturbance would occur on either side of the road areas. Road removal is planned to include removal of the asphalt and some ripping of the roadbed prior to reseeding. Within Preble's habitat the road areas will be ripped to a depth of at least 24 inches. The areas where the culverts are removed will be recontoured as a stream channel. The total area in Preble's protection areas that may be disturbed is estimated to be about 2.06 acres, of which 1.83 acres is lower quality habitat and 0.23 acres is higher quality habitat.

Some "take" is likely as a result of the project because of the potential to harm or harass the Preble's mouse along the streams at the Site resulting from the use of heavy equipment and the excavation required for the project. Indirect effects may include noise, dust, and potential erosion or sedimentation from these areas. Impacts would be

temporary until the areas became revegetated. Best management practices will be used to minimize these impacts and disturbance to the surrounding Preble's mouse habitat. Redundant erosion controls may be used to prevent erosion and sedimentation problems in the streams. The project will conduct weekly inspections of erosion controls (more frequently after precipitation events) and maintain and make repairs as necessary through project completion. Revegetation of project areas would be conducted after completion of the project using native plant species and would follow the basic guidance provided in the habitat mitigation techniques document provided in Appendix A of Part II of the PBA. Post-mitigation monitoring would be completed following the protocols provided in Appendix B of Part II of the PBA.

The removal of the North Access Road and culverts and re-establishment of the stream channels at the stream crossings will create Preble's habitat at these locations. In addition, the removal of the North Access Road and associated culverts will restore the travel corridors for Preble's mouse movement into the upper reaches of North and South Walnut Creek, the side drainage off North Walnut Creek that goes up between Buildings 371 and 771, and a new south stream reach off North Walnut Creek that will be created in the borrow area (Figure 5). The middle location will connect the drainage east of Buildings 116 and 117 to North Walnut Creek. This project will remove barriers to Preble's mouse movement, restore previously existing travel corridors, increase wetlands acreages, add to the available suitable habitat for the Preble's mouse, and potentially increase the long-term sustainability of Preble's mouse populations in Walnut Creek at the Site. These areas will be reseeded with native plant species following the guidelines outlined in Appendix A of Part II of the PBA. The creation of Preble's habitat is discussed further in the mitigation section of Part II of the PBA.

3.8 Dam Maintenance and Safety Activities

Part I of the PBA lists several vegetation management activities required for dam maintenance and safety at the Site. These activities are required for dam safety inspections which are conducted throughout the year. The dam maintenance activities listed in Part I of the PBA have already been consulted on, and follow the guidance provided in the BE entitled *Vegetation Management on Water Control Structures and Related Actions in Preble's Mouse Habitat* (DOE 2001; Part I, Appendix C) and USFWS concurrence letter (concurrence letter dated, November 27, 2001; Part I, Appendix C).

Recent inspections, however, have revealed the need for more frequent inspections of the dams and inspection reports have stated that "…all vegetation obscuring visual inspection of the outlet area should be permanently removed," (Federal Energy Regulatory Commission [FERC] report, August 23, 2002; Appendix E of Part II of the PBA). Independent engineers inspecting the dams per State of Colorado requirements have written findings that state "Willows on the upstream slope of B-1 [pond] prevented complete observation. These willows should be cleared immediately so the upstream slope can be re-inspected," (Wright Water Engineers dam inspection report, September 10, 2002; Appendix E of Part II of the PBA). Additional findings from this report stated,

"Keep trees, brush, and vegetation cleared at all times from the toe areas near the low-level outlets at A-2, A-3, and C-2 [ponds]. This is important so that changes in seepage in the vicinity of the low-level outlet pipes can be monitored regularly." As a result, it is necessary to remove vegetation around the outlet works and other locations on the dams throughout the growing season and not just in the early spring as previously consulted on.

As a result, all the ponds are included in this project (A-1, A-2, A-3, B-1, B-2, B-3, B-4, B-5, and C-1). The East Landfill Pond (Present Landfill Pond), and the A-4 and C-2 ponds, are not located in Preble's habitat and are therefore not considered (see figures in Appendix E). Vegetation removal will involve mowing, hand clipping, and weed whacking vegetation on dams (at the toe of the dams, surrounding the outlet works, and interior and exterior of dam faces) necessary to allow dam inspections throughout the year. The areas will be accessed on foot and hand tools – mechanical and/or powered – will be used to cut the vegetation. Appendix E of Part II of the PBA contains figures of each dam and shows where these activities may be conducted. The total acreage of these activities in current Preble's mouse protection areas is 3.38 acres. Of this, however, 3.16 acres are in lower quality habitat, 0.22 acres are in higher quality habitat. Per discussions with the USFWS, because these impacts are ongoing, they are being considered permanent.

For additional dam safety, riprap must occasionally be replaced or repositioned on the inside of the dam faces or at some spillway locations to protect the integrity of these structures. This activity is not only necessary to protect the integrity of the dams during high flow periods, but also to protect the downstream Preble's habitat. This activity may involve bringing new riprap to the dams to be placed at specific locations or in some cases may involve simply moving or repositioning riprap that has moved or settled over time. Heavy equipment will be required for this activity, but will remain on the dam crests or on spillway locations to conduct the work. No off-dam travel into undisturbed Preble's habitat is expected. Additional locations where riprap may need to be added are in the McKay Ditch, McKay Ditch bypass, SID, Woman Creek bypass around C-2, other ditches and riprap areas on Site. Riprap, as mentioned above, is not considered Preble's mouse habitat, therefore any work conducted in the riprap will not disturb the mouse or its habitat. Note: If the dams are not removed during Site closure, then dam maintenance activities will continue indefinitely.

3.9 Waste Water Treatment Plant (WWTP) Removal

The WWTP treats and discharges Site-generated liquid sanitary waste . Non-hazardous, non-radioactive liquid wastes are received at the WWTP; treated using activated sludge, tertiary clarification, sand filtration, and Ultra-Violet (UV) light disinfection; and released via pipeline to South Walnut Creek. About 150,000 gallons of sewage are treated daily to meet NPDES Permit requirements. Removal of these structures (buildings and pipelines) will be accomplished prior to closure of the Site.

Approximately 1/3 of the WWTP (eastern 1/3) lies within the current Preble's protection area at the Site (Figure 2). The WWTP buildings and parking lots are not considered Preble's habitat, however, some reclaimed grassland and riparian vegetation occur just south of the WWTP. Much of this may be disturbed and recontoured along with the North Access Road and Culvert Removal project described earlier that will remove the road embankments and restore the stream channel above ground. This latter acreage has been included with the North Access Road and Culvert Removal project. The remainder of the project disturbance (approximately 0.28 acres) consists of roads, parking areas , and the buildings. Once the parking lots and building (not considered habitat) are removed and revegetated these areas will be considered a creation of Preble's habitat and will be counted as a credit. The creation of Preble's habitat is discussed further in the mitigation section of Part II of the PBA.

Best management practices will be used to minimize these impacts and disturbance to the surrounding Preble's mouse habitat. Redundant erosion controls may be used to prevent erosion and sedimentation problems in the streams. Revegetation of project areas would be conducted after completion of the project using native plant species and would follow the basic guidance provided in the habitat mitigation techniques document provided in Appendix A of Part II of the PBA. Post-mitigation monitoring would be completed following the protocols provided in Appendix B of Part II of the PBA.

3.10 Site Water Reduction

This portion of the PBA discusses the water reduction issues with respect to Platte River species and the Preble's mouse at the Site. It addresses water reductions resulting from the loss of imported water to the Site and from the replacement of impervious land surfaces such as buildings and parking lots to vegetated plant communities.

3.10.1 Platte River Water Depletions

On July 1, 1997, the States of Nebraska, Colorado, Wyoming and the United States Department of the Interior entered into a cooperative agreement to address water depletion issues and threatened and endangered species along the Platte River. The purpose of the partnership is to develop a basin-wide recovery program for threatened and endangered species in the Central Platte River Basin. Called the Platte River Cooperative Agreement (PRCA), the program's primary purpose is to provide recovery oriented habitat for the whooping crane, piping plover and the interior least tern. The pallid sturgeon, which uses the Platte only near the mouth of the river, is also a target species for the proposed program. Other species which are now evaluated for impacts along the Platte River include Eskimo curlew, American burying beetle, and the western prairie fringed orchid. As a result, any activities that may deplete water going to the Platte River must be evaluated for potential impacts to these species.

The target flows for the endangered species in the Central Platte reflect the flow levels the USFWS believes are needed to provide adequate habitat for those species. Actual daily

flows historically have fallen short of those target flows, in the aggregate, by an average of approximately 417,000 acre feet (af) per year.

3.10.2 Preble's Mouse Water Reduction Issues

At the Site, the Preble's mouse habitat exists along each of the streams. As Site cleanup and closure proceeds, imported water for sanitary purposes and the associated discharge will be eliminated. In addition, as the buildings and parking lots (impervious surfaces) are removed and replaced by grassland, water infiltration will be increased in those areas, reducing surface water run off to the drainages.

A recently completed Site-Wide Water Balance (SWWB) modeling study (K-H 2002b) allows for estimation of changes in surface and subsurface hydrology at the Site. For more details of the water balance study results, please refer to the complete copy of the report found on CD-ROM Appendix F of Part II of the PBA.

Based on the water balance study, no changes will be made to water flows in Rock Creek as a result of Site closure activities. This watershed is isolated from the IA activities. The study also showed that in Woman Creek, surface flows exiting the Site near Indiana Street will be largely unaffected by changes resulting from the Site closure activities. Wet year or dry year water flows stayed at slightly above 200,000 m^3/year during wet years, and at slightly below 100,000 m^3/year in dry years. Upstream of the C-2 pond no changes in surface flows are expected as a result of the IA cleanup and closure because currently no water reaches the stream from the IA because of the SID. Although runoff in the SID basin is expected to decrease as a result of changes in the IA, no discharges were predicted for Pond C-2 in any of the scenarios modeled. As a result, little change should occur in Woman Creek flows.

The model, however, did show substantial changes in the hydrology of Walnut Creek. Walnut Creek discharges decreased for the following three reasons: (1) Waste Water Treatment Plant contributions to Walnut Creek were eliminated; (2) impervious surfaces in the Industrial Area were removed, thereby eliminating fast runoff; and (3) building drain discharges to Industrial Area streams were eliminated.

Based on the Site Wide Water Balance Study, under the No Imported Water Scenario, off-Site surface discharge in Walnut Creek decreased from about 800,000 m^3/year to 510,000 m^3/year in wet years, and from 450,000 m^3/year to 190,000 m^3/year in dry years. Under the Land Configuration Scenario, off-Site surface discharge in Walnut Creek decreased from about 800,000 m^3/year to 180,000 m^3/year in wet years. In dry years the modeling showed a decrease from 450,000 m^3/year to 20,000 m^3/year. The Land Configuration Scenario described the combined effect of the no imported water in addition to the reduced water from surface water flows in the IA. Overall reductions of water flow at the Site boundary in Walnut Creek are estimated to range from about 78 percent in wet years to about 96 percent in dry years.

3.10.3 Analysis of Impacts

3.10.3.1 Platte River Species

The changes in water flows at the Site resulting from imported water losses and increased infiltration in the Industrial Area (IA) associated with removal of impervious surfaces, will have no effect on Platte River species. While an overall decrease in the volume of water leaving the Site boundary will occur, the imported waters cannot be counted, because the water purchased from the Denver Water Board is western slope water. The water originates west of the continental divide (from tributaries to the Fraser River), is pumped through the Moffat Tunnel into Gross Reservoir, then runs through the South Boulder Diversion Dam into Ralston Reservoir. From Ralston Reservoir, the water enters the Site and into the raw water pond through an under ground pipeline. Western slope water cannot be used to alleviate depletions in the Platte River basin. Remaining water losses from removal of the ponds and impervious surfaces at the Site are returning the Site to the pre-disturbance state which existed prior to Rocky Flats. Reestablishment of the natural stream flows and revegetation of the IA will have no effect on the Platte River species.

3.10.3.2 Preble's Mouse

Historically, prior to European settlement, no data on the water flows or vegetation communities exists. Prior to DOE acquisition, however, the area was used for ranching. Historical aerial photographs from 1937 and 1951 show little to no riparian vegetation (i.e. shrubs and trees) along the stream courses at the Site due to the heavy grazing pressures that were present prior to DOE purchase. However, after DOE acquired the Site, grazing was no longer permitted and in any of the three drainages (Rock Creek, Walnut Creek, and Woman Creek) and riparian vegetation began to establish and grow along the streams. The riparian vegetation that is currently along the streams at the Site has established over the past several decades since DOE purchase. In Rock Creek and Woman Creek these changes have occurred naturally since no changes in hydrology (i.e. no additional imported water) had occurred. The natural flows in these drainages were sufficient to establish and sustain the riparian vegetation in these drainages once the grazing pressure was removed. In Walnut Creek, natural water flows were augmented by imported water (2002 = approximately 420,000 m^3/year; K-H 2002b). Thus more water has been available in Walnut Creek since the DOE purchase than would have been available previously.

Modeling study results indicate that no water reduction will take place in Rock Creek due to Site closure activities. In Woman Creek, any changes that occur will be minimal, at most. While water flows in the Walnut Creek basin will be substantially less after Site closure, little to no scientific data exist to determine what will happen to the riparian vegetation along Walnut Creek. Preliminary modeling data from the Site Wide Water Balance Study suggest the water table could drop between one and three feet depending on the location along Walnut Creek. Discussions with regional ecologists and restorationists have suggested that some change in the vegetation is likely in the long-

term, however, the level of change is unknown. For many of the shrubs and trees currently growing near the stream, these plants are well established and are rooted deeply enough that even if the water table would drop, the plants would still be rooted deeply enough so most would likely survive. Additionally, any die off of trees or shrubs that might occur at specific locations where enough water was not available would likely happen slowly and not immediately. Ultimately, however, no one can predict accurately what may happen in the Walnut Creek drainage below the ponds.

Due to the uncertainty of what can be expected to occur in Walnut Creek in the long-term as a result of the water reductions, DOE and the USFWS have agreed to develop an adaptive management plan as part of the mitigation measures. This adaptive management plan will be developed in cooperation with the USFWS after the approval of the entire PBA. The adaptive management plan will identify parameters to be measured regarding Preble's mouse populations and habitat in Walnut Creek and adaptive management actions which may be taken if substantial threats to the Preble's mouse population are detected.

3.11 Unforeseen Projects Inside Current Preble's Protection Areas

The attempt has been made to identify every possible project at the Site that might occur in current Preble's protection areas. However, it is possible that something may have been missed or some new project identified will have to be conducted that may adversely affect the Preble's mouse. Therefore an additional total of two acres of current Preble's habitat are requested for potential disturbance under this PBA for unforeseeable project disturbances. Of the two acre total, a maximum of 0.25 acres could be a permanent loss of habitat. It is assumed to be higher quality habitat. Best management practices will be used to minimize disturbance to the Preble's mouse habitat. Revegetation of project areas would be conducted after completion of the project using native plant species following the basic guidance provided in the habitat mitigation techniques document provided in Appendix A of Part II of the PBA. Post-mitigation monitoring would be completed following the protocols provided in Appendix B of Part II of the PBA. Use of any portion of this two acre allotment will be documented and provided to the USFWS, however, the purpose of this allotment is to allow any unforeseen project(s) to go forward without delay.

4. Cumulative Effects

The Endangered Species Consultation Handbook (USFWS 1998) defines cumulative effects as "those effects of future State or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation" (50 CFR §402.02). A description of the surrounding lands and activities conducted on those lands is presented below.

The Site is surrounded by city, county, state, and federal lands. A variety of land use activities occurs on these lands. The land to the south of the Site is privately owned rangeland. It is currently used for grazing cattle. However, there are plans to develop portions of these properties as residential subdivision and business developments. The State of Colorado School Board land in Section 16 is also primarily rangeland, grazed by cattle throughout different times of the year. Gravel mining has occurred on this property in the past, however, none has taken place in recent years. The lands between Highway 93 and the mountain front to the west are largely City of Boulder, Boulder County, and Jefferson County open space properties used for some grazing and recreation activities. No development beyond perhaps some trails in the future is planned for these areas. Between the Site and Highway 93 there is a narrow strip of private property that the current landowner has attempted to develop in the past, with no success. If development would occur, it would most likely be some type of small business (either office space or perhaps light industry). On the western edge of the Site, within Site boundaries, two gravel mine operations are currently active. Current plans, dependent on permitting, would mine much of the western portions of the BZ at the Site.

The northwest corner of the Site is bounded by the National Renewable Energy Laboratory facility (NREL). Research on renewable wind energy is conducted at the facility. Most activities involve the installation and removal of large wind generators. To the north, the Site is bordered by City of Boulder and Boulder County open space property. On the east, most of the land is City of Broomfield and City of Westminster open space property. A small amount of development (housing and office space) has occurred along Highway 128 east of Indiana Street. Along the eastern edge of the Site, there is a measure included in the Rocky Flats Wildlife Act that would allow a 300 foot corridor for development of the C-470 highway.

Because most of the surrounding land use is either rangeland or open space, no cumulative effects are expected to the Preble's mouse from these lands. These lands actually provide additional buffer areas around the Site as habitat. Where riparian habitat exists on some of these properties, steps (e.g. the use of fencing to keep cattle away from the streams) have been taken to preserve and enhance these corridors as wildlife habitat. Development activities planned for private property around the Site edges would be away from drainages at the Site and would have minimal or no effect on the mouse habitat at the Site.

The gravel mining operations on the western edge of the Site pose a potential threat to the Preble's mouse habitat at the Site. Subsurface flows provide water to the many seeps or stream flows that sustain Preble's habitat at the Site, particularly in the Rock Creek drainage. Because the drainages on Site lie largely at the headwaters of their respective watersheds, mining could potentially alter the subsurface water and surficial water flows on the Site. Currently no data exists on how the mining might impact the local hydrology. The mine operator continues to renew mining permits in order to expand

mining operations. Unchecked weed infestations on the mining operations could pose additional potential impacts to the Preble's mouse.

The proposed C-470 highway would potentially cut off the eastern most edges of the Preble's habitat at the Site in both the Walnut Creek and Woman Creek drainages. However, the habitat at these locations is of much lower quality than that found further west in either drainage. Preble's mice have never been captured within the area that would potentially become the highway.

Numerous easements exist at the Site for utilities such as power lines, gas lines, and telephone lines. Also water conveyance ditches for water rights owned by non-DOE parties cross the Site at various locations (McKay Ditch, Mower Ditch, Smart Ditch – D-Series Pond water rights). Mineral rights and mining operations are also present at the Site at some locations as mentioned above. Currently no planned activities at the Site related to these easements are scheduled. The responsibility for USFWS consultation for potential impacts to listed species resulting from normal operations, maintenance, and new construction activities related to these easements at the Site are the responsibility of the easement parties and would be dealt with through separate consultation with the USFWS.

Activities in areas surrounding the Rocky Flats Environmental Site will have no effect on DOE activities related to the cleanup of the Site.

5. Analysis Of Impacts

5.1 Definitions

The following definitions, cited from the Endangered Species Consultation Handbook (USFWS 1998), were used in categorizing the effects from actions discussed in Part II of the PBA on the selected threatened or endangered species considered in the PBA:

- "*No effect*" — the appropriate conclusion when the action agency determines its proposed action will not affect a listed species or designated critical habitat.

- "*May affect*" — the appropriate conclusion when a proposed action may pose any effects on listed species or designated critical habitat. When the Federal agency proposing the action determines that a "may affect" situation exists, then they must either initiate formal consultation or seek written concurrence from the Services that the action "is not likely to adversely affect".

- "*Is not likely to adversely affect*" — the appropriate conclusion when effects on listed species are expected to be discountable, insignificant, or completely beneficial.

- "*Is likely to adversely affect*" — the appropriate finding in a biological assessment (or conclusion during informal consultation) if any adverse effect to listed species may occur as a direct or indirect result of the proposed action or its interrelated or interdependent actions, and the effect is not: discountable, insignificant, or beneficial (see definition of "is not likely to adversely affect"). In the event the overall effect of the proposed action is beneficial to the listed species, but is also likely to cause some adverse effects, then the proposed action "is likely to adversely affect" the listed species. If incidental take is anticipated to occur as a result of the proposed action, an "is likely to adversely affect" determination should be made. An "is likely to adversely affect" determination requires the initiation of formal section 7 consultation.

- "*Jeopardize the continued existence of*" — to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species.

5.2 Part II Findings (Excluding Preble's Mouse)

The activities listed in Part II of the PBA will not affect water depletions within the greater Platte River basin. Therefore, no effects on the lower Platte River species are

likely to occur from these on-Site actions. Lower Platte River species considered in this evaluation include the piping plover, the least tern, the whooping crane, the pallid sturgeon, the Eskimo curlew, the American burying beetle and the western prairie fringed orchid.

The bald eagle is a casual user of the Site. Site wildlife surveys have noted approximately one observation per year for the past six years. Bald eagle nesting has never been observed on Site. Therefore, DOE actions described in Part II of this PBA will have no effect on the bald eagle. Black-footed ferrets, boreal toads, Canada lynx, greenback cutthroat trout, Mexican spotted owls, mountain plovers, and Pawnee montane skippers do not occur at or near the Site. Ten years of ecological monitoring have never documented these species at the Site (DOE 1992, 1994a, 1995; K-H, 1997, 1998, 1999, 2000, 2001b, 2002a, RMRS 1996). Therefore, the DOE actions described in Part II of this PBA will have no effect on these species. The black-tailed prairie dog occurs at the Site, but is a candidate species which is non-statutory and therefore is not considered in this PBA.

Ute ladies'-tresses, and Colorado butterfly plant, both listed species, though occurring in the Site's vicinity, have not been documented on the Site nor in off-Site areas that might be affected by these actions (ESCO 1993, 1994). DOE activities described in Part II of this PBA will have no effect on these species.

5.3 Preble's Mouse Analysis of Impacts and Findings

The Preble's mouse occurs at the Site, and has been documented and studied extensively in each of the main drainages at Rocky Flats. Studies at the Site have focused on trapping and tagging Preble's mice, and tracking their movements through the use of telemetry. In addition, habitat characterization has been done to quantify habitat parameters for the mouse at the Site. The data from these studies have yielded information on Preble's mouse habitat, areas of occupation, home ranges, and mouse movement at the Site. Using this information, Site ecologists developed the PPP (DOE 2000) that includes a Preble's mouse protection area map and a means of evaluating Site activities for potential impacts to the mouse. These actions have been taken proactively by DOE to protect the Preble's mouse and its habitat at the Site.

During 2002, the USFWS proposed critical habitat for the Preble's mouse (67 CFR 47154). On June 23rd of 2003, the USFWS finalized the critical habitat ruling for the Preble's mouse (68 FR 37275). The final rule excluded Rocky Flats Environmental Technology Site from critical habitat designation because the Site will become a USFWS National Wildlife Refuge after closure. Therefore, project disturbances described in this PBA are based on the current protection areas mapped in Figure 6. Because the Preble's mouse occurs at the Site, the major focus of Part II of the PBA has been on potential impacts to the Preble's mouse. The following paragraphs analyze the potential for the projects listed in Part II of the PBA to affect the Preble's mouse. Habitat creation

resulting from the project activities will be discussed in the mitigation section of Part II of the PBA.

As previously mentioned under each project description, "take" is likely as a result of these projects because of the potential each has to harm or harass the Preble's mouse. This determination is based on the USFWS definitions (USFWS 1998) that defines harm as *"significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as breeding, feeding, or sheltering"* and harass *"as actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering."* Each of the projects in Part II of the PBA are located within the current Preble's protection area. Some of the projects may result in a permanent loss of habitat. Some of the projects have the potential to disturb large areas of Preble's protection areas. Many of the project activities will be conducted off established roads, two-tracks, or historical travel routes. Heavy equipment (i.e., front end loaders, track hoes, back hoes, etc.) is necessary to conduct most of the activities when in the current Preble's protection area. Additionally, many of the projects will require vegetation to be removed or damaged during these activities, and soil disturbance will likely occur for some of the projects. Finally, the activities listed in Part II of the PBA exceed the criteria listed in Part I of the PBA for "no effect" and "may affect, but not likely to adversely affect" impacts. As a result, the scale and scope of these projects have resulted in a finding that these projects will likely adversely affect the Preble's mouse and are likely to result in some "take".

One of the projects is largely located on the hillside located adjacent to the riparian habitat along the stream in Woman Creek (Original Landfill Project). Most of the direct impacts from this project will be a temporary loss of mesic grassland habitat on the hillside adjacent to the stream. Some disturbance of the higher quality riparian habitat on the north side of the stream within the project area is expected. The hillside areas are of lower quality habitat because these areas are grassland vegetated with exotic graminoid species. Restoration with native plant species will improve the quality of the grassland habitat at most of these locations where weeds or exotic graminoids are present and provide higher quality habitat in the long-term for the Preble's mouse.

The Monitoring Well Installation project may or may not have much impact to the Preble's mouse depending on where in current Preble's protection areas the project actually takes place. If project activities occur along the streams in riparian habitat, where Preble's mice are known to occur, there is greater impact potential than if they occur on the adjacent mesic grasslands or in areas where Preble's mice have never been captured. Temporary loss of habitat is the major impact from these activities, with most of this being scattered throughout the drainages or project area. Because these activities are not disturbing large areas at one location the impacts are reduced. Some small permanent loss of habitat will occur if monitoring wells are installed, however, with the placement of concrete well pads (about 13 square feet per well). Revegetation with

native plant species will reestablish the plant communities and vegetation structure at these project locations.

The Surface Water Monitoring Equipment Removal and Surface Water Permanent Flume Removal projects are scattered along the streams and will temporarily impact Preble's mouse habitat while ultimately increasing and improving the amount of habitat by removing man-made structures from the streams. Depending on the location of these projects along the streams the quality of Preble's habitat may vary from higher quality habitat where mice have been captured to lower quality habitat where no mice have been captured. Revegetation with native species will restore the areas to higher quality habitat for the mouse.

Impacts from the Surface Water Permanent Flume Installation and Replacement Project will occur largely in the riparian habitat along the stream. Most impacts will be temporary with the exception of where the flume itself is located. Depending on the actual location, the quality of the habitat may vary from lower to higher quality.

The Dam Safety and Maintenance Projects will occur near or on the dam faces. Because the vegetation removal needed for dam safety inspections must occur during the active season of the mouse there is the potential for adverse effects. The habitat on the dams themselves is largely lower quality habitat (i.e., grass) and provides little cover from predators. Therefore the potential to affect the mouse is somewhat lessened.

The North Access Road and Culvert Removal Project is likely to have some impact on the mouse where the project encroaches into mouse habitat. However, this impact is offset by the fact that the removal of the culverts and re-establishment of the stream drainage above ground has the potential to create addition Preble's mouse habitat and provide better connectivity between isolated patches of habitat along Walnut Creek. This is discussed further in the mitigation section.

The Pond Remediation and Removal Projects have the potential to have the greatest impacts to the Preble's mouse. These activities will take place along the streams themselves and may temporarily eliminate large areas of riparian vegetation at the project locations. Each of these areas is known to contain Preble's mouse populations (with the exception of the area around the C-2 pond and between the A-3 and A-4 ponds). Some potential to create habitat exists if open water, riprap, and road surfaces are converted to habitat.

The removal of the WWTP from Preble's habitat will itself have little direct impact to the Preble's mouse. No Preble's mice have been captured west of the North Access road at that location (DOE 2003). Additionally, most of the project area consists of buildings and parking lots and is not considered habitat. Removal of the buildings and parking lots will create additional Preble's mouse habitat and so will have a positive benefit on the mouse.

The water reduction response of the vegetation in lower Walnut Creek resulting from the loss of imported water and changes in the IA are unknown. Because no data are available on what will happen when water is turned off to a drainage, DOE and the USFWS have agreed to develop an adaptive management plan to address the Preble's mouse and habitat issues and strategies to monitor and manage the habitat in Walnut Creek.

Projects listed in Part II of the PBA will likely adversely affect the Preble's mouse. The potential exists for direct take of the mouse because of excavation activities and use of heavy equipment as well as from indirect effects that may affect vegetation structure along the streams. Disturbance of the vegetation will temporarily remove protective cover and potential food and nesting materials. Disturbance of the ground could impact hibernacula along the streams. Thus, given the potential scope and scale of these projects in Part II of the PBA, it is likely that adverse effects to the Preble's mouse will occur.

Although the projects listed in Part II of the PBA will temporarily disturb Preble's habitat at several locations, the locations are generally spatially separated from one another with quality habitat adjacent to and in between project locations so that the Preble's mice can continue to use these areas (Figure 2). At each of the project locations there are typically several hundred feet of undisturbed riparian habitat available for the Preble's mouse to use during the project duration. Additionally, the project areas themselves are not located directly in the prime habitat areas in Walnut Creek or Woman Creek and so the major populations known to occur in these areas will not be directly impacted. In Walnut Creek, the high population areas are located above the A-1 pond, between the B-4 and B-5 ponds, and below the confluence of Walnut Creek with the McKay Ditch in lower Walnut Creek. None of these areas will be located within the project areas. In Woman Creek, the Preble's mice are known to occur between the C-1 and C-2 ponds, and west of the C-1 pond to the Site boundary. So several thousand feet of quality Preble's habitat exists adjacent to the project areas in the two drainages.

The final 4(d) rule for the Preble's mouse (67 FR 61531-61537) set forth a precedent that in principle if suitable habitat exists adjacent to a temporary project disturbance (i.e., ditch maintenance as addressed in the 4(d) rule), the action would "result in only minimal take of Preble's and is consistent with the protection and enhancement of Preble's habitat." Previous projects conducted in Preble's habitat at the Site during the active season of the mouse have shown the mice can co-exist near active project areas with little apparent impacts (DOE 1996, K-H 2000). At both the B-4 dam toe slope sand/rock blanket project (DOE 1996) and the East Trenches treatment system project (K-H 2000), trapping and/or telemetry studies during the project timeframes demonstrated that the Preble's mice continued to exist adjacent to the ongoing projects. For both of these projects heavy equipment, vegetation removal, soil disturbance, and excavation, were being conducted in current Preble's protection areas. At the East Trenches treatment system project, several hundred feet of Preble's habitat was disturbed along the entire B-series of ponds (B-1 to B-4). The USFWS concurred that the East Trenches treatment system project would not have an adverse effect on the Preble's mouse (USFWS concurrence letter dated January 22, 1999; Part II, Appendix D). In neither case,

however, did the Preble's mice leave the stream reach where the project activities were taking place. Rather they continued to be captured in the traps, and based on telemetry data, continued to use the habitat adjacent to the project areas during the duration of the projects. Often the Preble's mice were found just across the silt fence from where project activities were taking place. The conclusions of these studies were that the mice would not be extirpated from areas where projects occurred provided that suitable Preble's habitat was available adjacent to the project areas.

Further evidence of the resilience of the Preble's mouse to disturbance was observed during the summer of 2002 in the Rock Creek drainage at the Site where a wildfire in February 2002 burned about 27 acres. Almost 2,200 linear feet of the grassland and riparian vegetation on the north side of Rock Creek was burned along the stream edge. Of this, an additional 280 feet of habitat was burned completely across the stream where the fire crossed the stream and burned to the pediment top on the opposite side of the valley. Small mammal trapping was conducted in June 2002 and a set of 50 traps was located in and adjacent to the burn area. Twenty-five traps were located on the north side of the fire (with nearly all the traps located in burned areas) and 25 traps located on the south side of Rock Creek in unburned habitat. Two Preble's' mice, an adult male and adult female, were captured about two meters from the edge of the burned area on the north side of the stream on different days. Additionally, while running the trap line one morning, an individual Preble's mouse was observed hopping along in the burn area. So a natural disturbance, much larger than any of the planned cleanup activities in Part I of the PBA did not extirpate the Preble's mouse from these areas since they stayed in the habitat adjacent to the wildfire and even ventured into the burn area.

For each of the projects outlined in Part II of the PBA, in addition to those in Part I, substantial Preble's habitat exists upstream and downstream of the project areas that will not be disturbed. Preble's mice have been documented to move almost one mile in a single night at the Site (K-H 1999), and 2.7 miles over a year or two based on data from the Air Force Academy (Schorr 2003). Therefore, although the closure activities outlined in Part I and Part II of the PBA will disturb several locations along the streams at the Site, in some cases simultaneously, there will be substantial Preble's habitat available adjacent to the project areas where the mice can move to for the duration of the projects. In the end, the long-term result of these projects will remove human influence and structures from the Preble's habitat areas and result in higher quality habitat for the mouse in the future.

5.4 Summary of Findings

The following table summarizes the findings of Part II of the PBA.

Fauna	**Legal Status**	**No Effect**	**May Affect, No Adverse Effects**	**Adverse Effects**
American burying beetle*	LE	X		
Bald eagle	LT	X		
Black-footed ferret	LE	X		
Black-tailed prairie dog	C	X		
Boreal toad	C	X		
Canada lynx	LT	X		
Eskimo curlew*	LE	X		
Greenback cutthroat trout	LT	X		
Least tern *	LE	X		
Mexican spotted owl	LT	X		
Mountain plover	PT	X		
Pallid sturgeon*	LT	X		
Pawnee montane skipper	LT	X		
Piping plover*	LT	X		
Preble's meadow jumping mouse	LT			X
Whooping crane*	LE	X		
Flora				
Colorado butterfly plant	LT	X		
Ute ladies'-tresses	LT	X		
Western prairie fringed orchid*	LT	X		

* = Lower Platte River species
C = Candidate for listing
LT = Listed threatened
LE = Listed endangered
PT = Proposed threatened

Should any of the Site activities listed in Part II of the PBA change in scope, function, or process from what is presented in this document, further consultation (informal or formal) with the USFWS will be pursued.

5.5 Environmental Baseline

In Jefferson County, the Preble's mouse has been captured or suitable habitat exists along portions of Coal Creek and Ralston Creek, in addition to that found in Rock Creek, Walnut Creek, Woman Creek, and Smart Ditch at the Site. More detailed information on Preble's mice at the Site is contained in Appendix A of Part I of the PBA that contains the Preble's Protection Plan ("*Designation of Preble's Mouse Protection Areas at Rocky*

Flats Environmental Technology Site"). Based on the availability of potentially suitable habitat and lack of trapping information, Preble's mice are assumed to occupy appropriate habitat throughout Jefferson County.

In Boulder County, the Preble's mouse has been captured or suitable habitat exists along portions of Coal Creek, South Boulder Creek, Saint Vrain Creek, and within the City of Boulder Open Space and Mountain Parks system. Preble's habitat also exists along South Boulder Canal, Doudy Draw, and Spring Brook. Based on the availability of potentially suitable habitat and lack of trapping information, Preble's mice are assumed to occupy appropriate habitat throughout Boulder County.

During 2002, the USFWS proposed critical habitat for the Preble's mouse (67 CFR 47154). On June 23rd of 2003, the USFWS finalized the critical habitat ruling for the Preble's mouse (68 FR 37275). The final rule excluded the Rocky Flats Environmental Technology Site from critical habitat designation because the Site will become a USFWS National Wildlife Refuge after closure.

6. Conservation Measures

In accordance with the Endangered Species Consultation Handbook (USFWS 1998), conservation measures are defined as follows: "Conservation measures represent actions pledged in the project description that the action agency or applicant will implement … Since conservation measures are part of the proposed action, their implementation is required under the terms of the consultation." To offset the potential impacts of the projects described in Part II of the PBA for the Site, the following conservation measures are proposed.

6.1 Current Conservation Measures at the Site

6.1.1 Memoradum of Agreement

A memorandum of agreement for coordination of endangered species compliance for Site activities was signed by the DOE, USFWS, EPA, CDPHE, and CDNR, in 1999 (DOE 1999). The purpose of the MOA was to develop a process by which the various parties could work together to achieve compliance with the mandates of the RFCA, Site closure activities, and the ESA. The PBA is one of the outcomes of the MOA.

6.1.2 Site Procedures

Two Site procedures also exist that help protect the Preble's mouse habitat. The two procedures are the *Identification and Protection of Threatened, Endangered, and Special-Concern Species* and *Wetland Identification and Protection* (DOE 1994b, 1997). These procedures require projects to be evaluated for ESA and wetland issues.

6.1.3 Monitoring

Since the early 1990's when the Preble's mouse was first discovered to occur at the Site, DOE has actively pursued gathering scientific information on the mouse. Through the use of live trapping, tagging, and telemetry, in addition to extensive habitat characterization, the Site has provided a great deal of knowledge to the scientific community on the behavior and habitat requirements of the Preble's mouse. These data were used to develop the PPP and associated map and have been used to evaluate proposed projects. Ecology staff at the Site have contributed to the technical working group for the Preble's mouse for the past several years.

6.2 Conservation and Mitigation Considerations

One of the things that needs to be considered regarding the Site closure activities is that the work the Site is doing is the opposite of what most ESA Section 7 consultations involve. Most other Section 7 consultations are conducted with regard to projects that are

intruding into and permanently destroying Preble's habitat. Urbanization and development, along with other activities along the Front Range continues to reduce and destroy more and more habitat especially along the riparian corridors. Therefore it is increasingly important to protect not only the corridors themselves, but also the buffer areas around the corridors that provide the essential factors and services needed to sustain the roles and functions of the riparian communities. Therefore the criteria used to evaluate projects should be more stringent (i.e. protecting larger, wider areas of habitat along the streams and riparian corridors) when projects are intruding on Preble's habitat and replacing it permanently. At the Site, however, the opposite is occurring. While the cleanup activities are necessary for Site closure, the vast majority of the activities that are taking place in Preble's habitat are being done not to develop areas within Preble's habitat, but to remove previous evidence of human activities or structures. The goal is to return the Site, and in particular, the stream drainages to a more natural, functioning ecosystem. Therefore some consideration of the larger picture is essential when evaluating and developing the conservation and mitigation requirements for impacts resulting from Site closure activities.

6.3 Proposed Conservation Measures

In addition to the current conservation measures already in place at the Site (mentioned above), the following conservation measures, are proposed to offset potential impacts from the projects in this PBA.

6.3.1 General Conservation Measures

The general conservation measures are those to be implemented that are not project specific.

- Education of Site personnel may be conducted to inform employees of the ESA issues. The use of the Site newspaper, email system, the environmental checklist process, and communication with project managers will be used to inform employees of ESA issues.

- Continue to use best management practices to avoid and minimize impacts to Preble's mouse habitat.

- No seeding of non-native plant species will be conducted for Preble's mitigation projects (with exception of certain cover crops if necessary).

6.3.2 Project Specific Conservation Measures

Project specific conservation measures are those that will be required of actual projects impacting Preble's habitat.

- First avoid then minimize potential impacts to the Preble's mouse habitat. If these options are not feasible, then mitigate.

- Limit disturbance to the smallest area practical to accomplish the work.

- Vehicle use shall be limited to existing routes and areas of disturbance except as necessary to access or define boundaries for new areas of construction or operation.

- All workers shall strictly limit their activities and vehicles to designated areas.

- Workers shall be informed of these terms and conditions.

- Erosion controls (i.e., silt fence, hay bales, mulching, tackifiers, surface roughening) will be used to prevent wind and water erosion, and sedimentation at project locations. Redundant erosion control may be used where necessary.

6.3.3 Mitigation Measures

Mitigation for impacts to Preble's mouse habitat (current Preble's protection areas) will be conducted as follows. Impacts to lower quality habitat will be mitigated at a ration of 1.5:1 and impacts to higher quality habitat will be mitigated at a ratio of 2:1.

- The removal of the North Access Road and associated culverts will restore the travel corridors for Preble's mouse movement into the upper reaches of North and South Walnut Creek, the side drainage off North Walnut Creek that goes up between Buildings 371 and 771, and a new south stream reach off North Walnut Creek that will be created in the borrow area (Figure 5). The middle location will connect the drainage east of Buildings 116 and 117 to North Walnut Creek. When a 100 foot buffer is placed around the around the edge of these new Preble's mouse corridors, like that used from the edge of the riparian habitat for the current Preble's protection area map, this will create up to an additional 41.00 acres of Preble's habitat at the Site (Figure 5). These actions will remove barriers to Preble's mouse movement, restore previously existing travel corridors, increase wetlands acreages, add to the available suitable habitat for the Preble's mouse, and potentially increase the long-term sustainability of Preble's mouse populations in Walnut Creek at the Site. These areas will be reseeded with native plant species following the guidelines outlined in Appendix A of Part II of the PBA.
- Within current Preble's protection areas, open water, riprap, concrete, roads, and structures are not considered Preble's habitat. If project activities convert these types of areas from non-habitat to habitat, through removal and reseeding efforts, these actions will be considered habitat creation. After project completion, created habitat will be delineated and mapped, acreage calculated, and that area taken as credit to offset debits. It will be tracked in the mitigation debit/credit worksheet discussed below.
- A total of 30 acres (60:1 ratio for the 0.5 acres needing mitigation) of weed control to control noxious weeds on uplands adjacent to Preble's mouse habitat at the Site will

be conducted for three years as mitigation. Locations will be selected in Walnut or Woman Creek based on annual weed infestation evaluations.

- Since 1999, RFETS has conducted weed control on approximately 4,600 acres of upland area surrounding Preble's mouse habitat at the Site (both ground and aerial herbicide applications). Additionally, hundreds of biocontrol insects have been released at the Site to help control weeds such as diffuse knapweed, dalmatian toadflax (*Linaria dalmatica*), musk thistle (*Carduus nutans*), Canada thistle (*Cirsium arvense*), St. Johns-wort (*Hypericum perforatum*), and bindweed (*Convolvulus arvensis*). These actions have been taken to maintain the high quality of the surrounding upland habitat at the Site.
- Develop an adaptive management plan with the USFWS for the Walnut Creek drainage to identify parameters to be measured regarding Preble's mouse populations and habitat in Walnut Creek and adaptive management actions which may be taken if substantial threats to the Preble's mouse population are detected.
- Provide education, training, and information to Site employees and subcontractors about Preble's mouse issues and to refer to this PBA before conducting the covered activities listed in the PBA.

The table below listed the type of impact, mitigation ratio, total acreage impacted, and the total acreage to be mitigated.

Impact Type Debits	Mitigation Ratio	Maximum Acreage Impacted	Total Mitigation Acreage Needed
Temporary Lower Quality Habitat	1.5:1	37.20	55.8
Temporary Higher Quality Habitat	2:1	13.98	27.96
Permanent Lower Quality Habitat	1.5:1	4.14	6.21
Permanent Higher Quality Habitat	2:1	1.36	2.72
Total Debits			92.69
Total In-Situ Mitigation (Acres)			51.18
Debit Remaining After In-Situ Mitigation			41.51
Total Habitat Creation Credits (Acres)*			41.00
Balance			-0.51
Remaining balance to be made up with weed control and small project habitat creation. See bullets above.			

* Total Habitat Creation Credits (Acres) = These credits are largely coming from the North Access Road and Culvert Removal Project that will re-establish the connectivity between the lower and upper reaches of Walnut Creek and provide Preble's habitat throughout the drainages the IA. The (+) has been added because additional habitat creation is expected, but cannot currently be quantified, at locations where roads, riprap areas, dams, parking lots, structures, and open water (that are not considered habitat even though they lie within the current Preble's protection areas) are converted to habitat.

Based on the table above, a total of up to 41.00 acres will be mitigated for disturbances resulting from closure activities specified in Part II of the PBA by re-establishing and re-connecting the stream reaches in the IA to North and South Walnut Creek. The

additional mitigation necessary will be achieved by weed control efforts and smaller project habitat creation as discussed above.

6.4 Benefits of remediation actions.

Although long-term benefits to an endangered species cannot be used as justification for allowing an action, these are still positive benefits that will result to the Preble's mouse habitat from the Site closure. Some of these include:

- Increase in Preble's habitat at the Site.
- Removal of travel barriers and re-establishment of travel corridors for Preble's mice in Walnut Creek.
- Restoration of more natural stream drainages.
- Restoration of natural stream flows.
- Reduced human impacts and disturbances from monitoring and/or project activities along the streams.
- Removal of buildings and other artificial structures from Preble's mouse habitat.
- Creation of higher quality Preble's habitat at some locations (i.e., replacement of some ponds and cattail marshes with riparian woodlands/shrublands).
- Better connectivity of previously separated or isolated Preble's populations in the drainages.
- Return of Site to more natural conditions.

6.5 Tracking Debits and Credits to Preble's Habitat

A spreadsheet will be used to track debits and credits for Preble's impacts at the Site. An example of the mitigation debit/credit spreadsheet and the associated definitions are shown in Appendix G of Part II of the PBA. This information will be provided to the USFWS in the annual report discussed below.

6.6 Reporting

An annual report will be produced and provided to the USFWS by December 31 of each year that includes:

- A summary of annual activities conducted under the PBA,
- The total disturbed acreage of Part II projects on a project basis and as an annual total tracked in a project database,
- Documentation of monitoring and revegetation success of Part II projects per PBA,
- Documentation of any additional consultation discussions with the USFWS on PBA issues or amended projects.

The reporting requirement will continue until DOE and the USFWS agree that the requirements of the PBA have been met.

7. Summary

Part II of the PBA was prepared in order to address activities that are "likely to adversely affect" the species under consideration in this PBA or the Preble's mouse or its habitat (current protection areas at the Site).

The species evaluated in Part II of the PBA include the American burying beetle*, Bald eagle, Black-footed ferret, Black-tailed prairie dog, Boreal toad, Canada lynx, Eskimo curlew*, Greenback cutthroat trout, Least tern *, Mexican spotted owl, Mountain plover, Pallid , sturgeon*, Pawnee montane skipper, Piping plover*, Preble's mouse, Whooping crane*, Colorado butterfly plant, Ute ladies'-tresses, and Western prairie fringed orchid*. Species noted with an (*) are South Platte River species.

Impact analyses determined that there would be no effect from any of the activities listed Part II of the PBA on the species evaluated, with the exception of the Preble's mouse. The findings with respect to the Preble's mouse indicate that each of the activities presented in Part II of the PBA are likely to adversely affect the Preble's mouse. Conservation and mitigation measures are proposed to minimize and mitigate for impacts to the Preble's mouse. In light of impact analyses, and the mitigation and conservation commitments, the DOE's proposed activities necessary to close the Site are not likely to jeopardize the continued existence of any federally listed, proposed, or candidate species.

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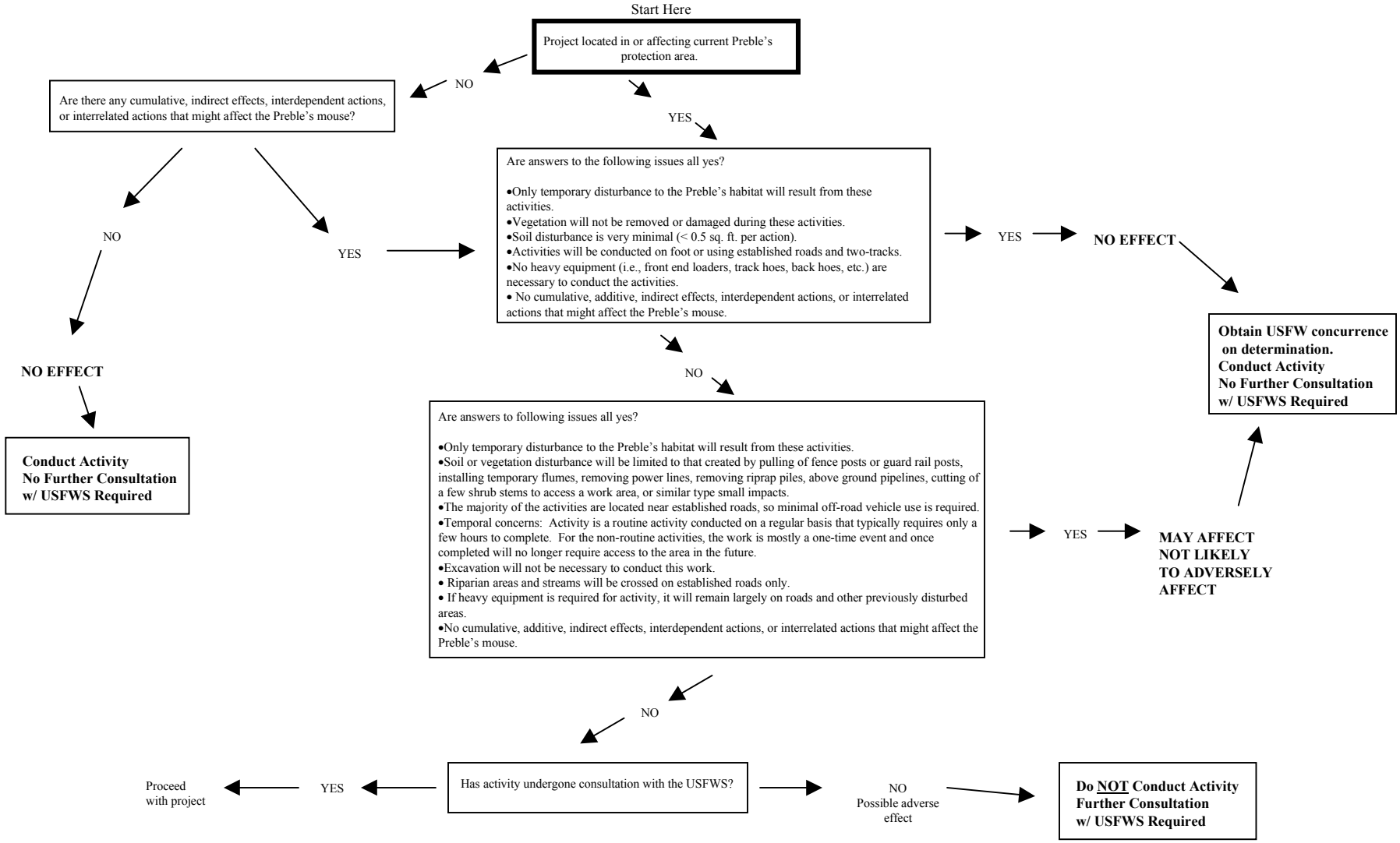
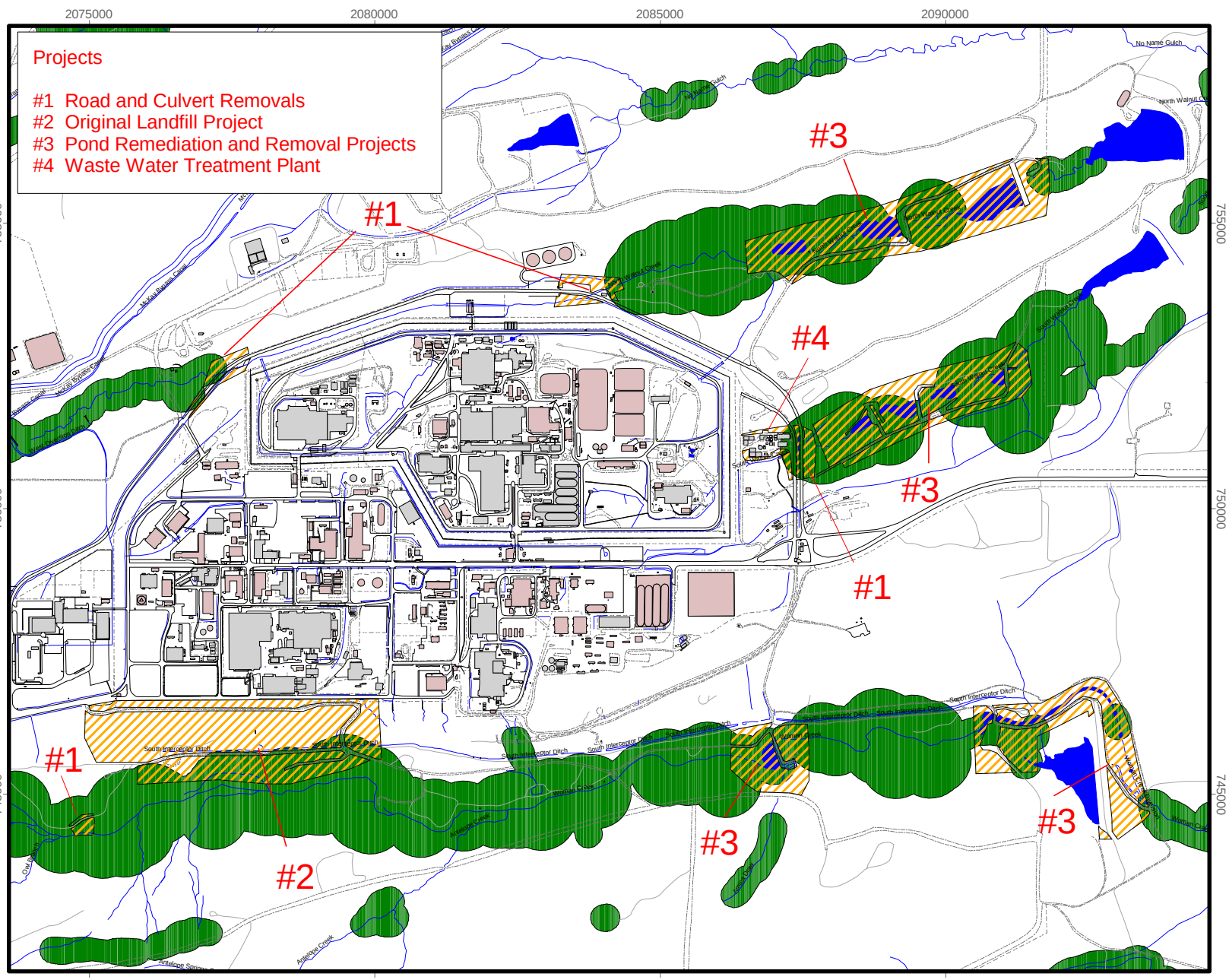
Figure 1. Project Activity Preble's Mouse Impact Determination Flowchart





Projects Likely to Adversely Affect the Preble's Mouse Programmatic Biological Assessment Part II

Figure 2

LEGEND

- Current Preble's Protection Areas
- Project Footprint

Standard Features

- Buildings
- Demolished Buildings
- Lakes & ponds
- Streams & ditches
- Fences
- Paved roads
- Dirt roads
- Contours (20 ft. intervals)

DATA SOURCE BASE FEATURES:
Buildings, fences, hydrography, roads and other structures from 1994 aerial fly-over data captured by EG&G RSL, Las Vegas.
Digitized from the orthophotographs, 1/95.

N

1000 0 1000 Feet

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by: Professional Environmental Group, L.L.C.

For: Kaiser-Hill Company, LLC

RFETS GIS Dept.
303-966-7707

MAP ID: 04-0009

January 15, 2004

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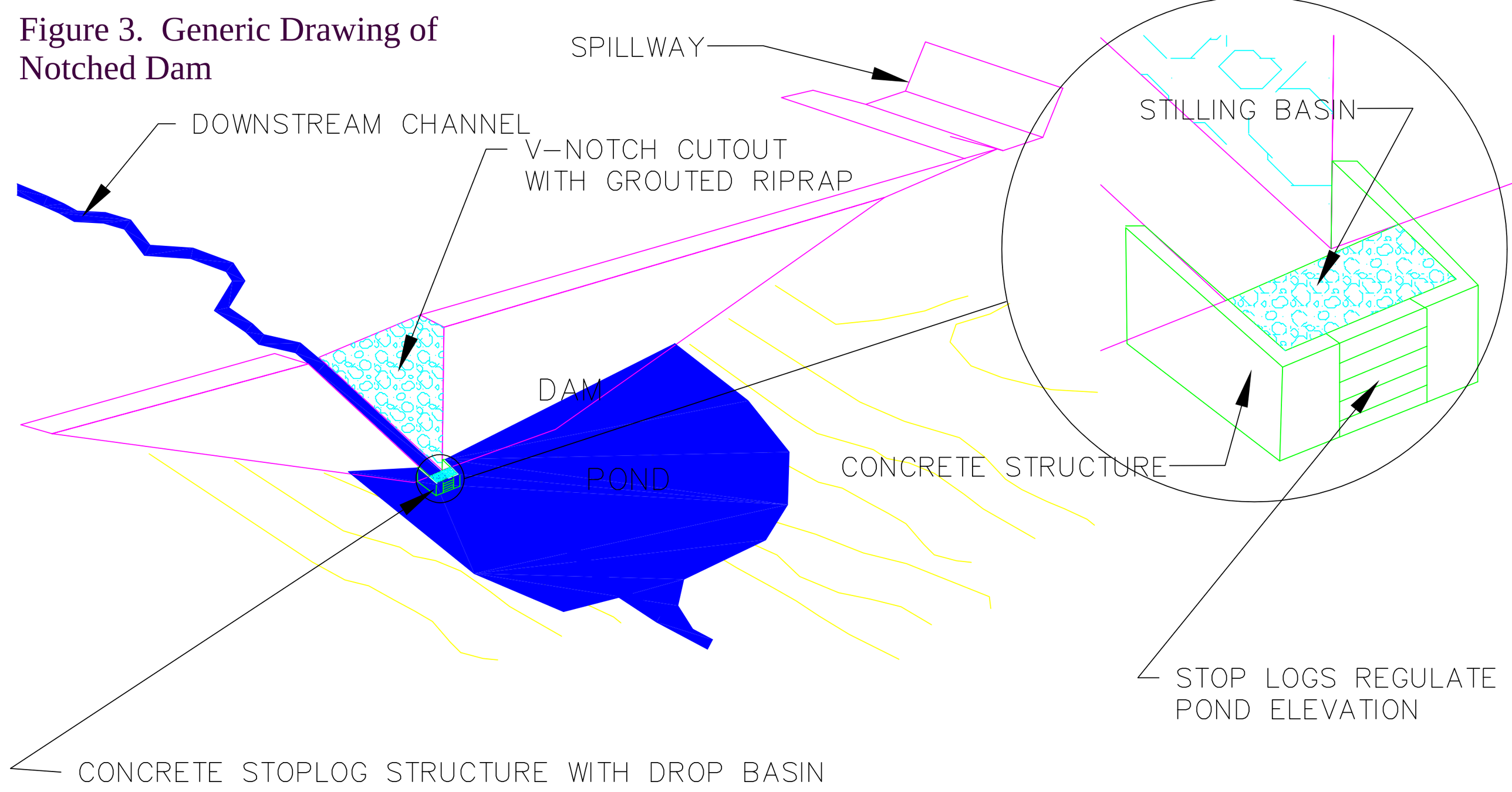
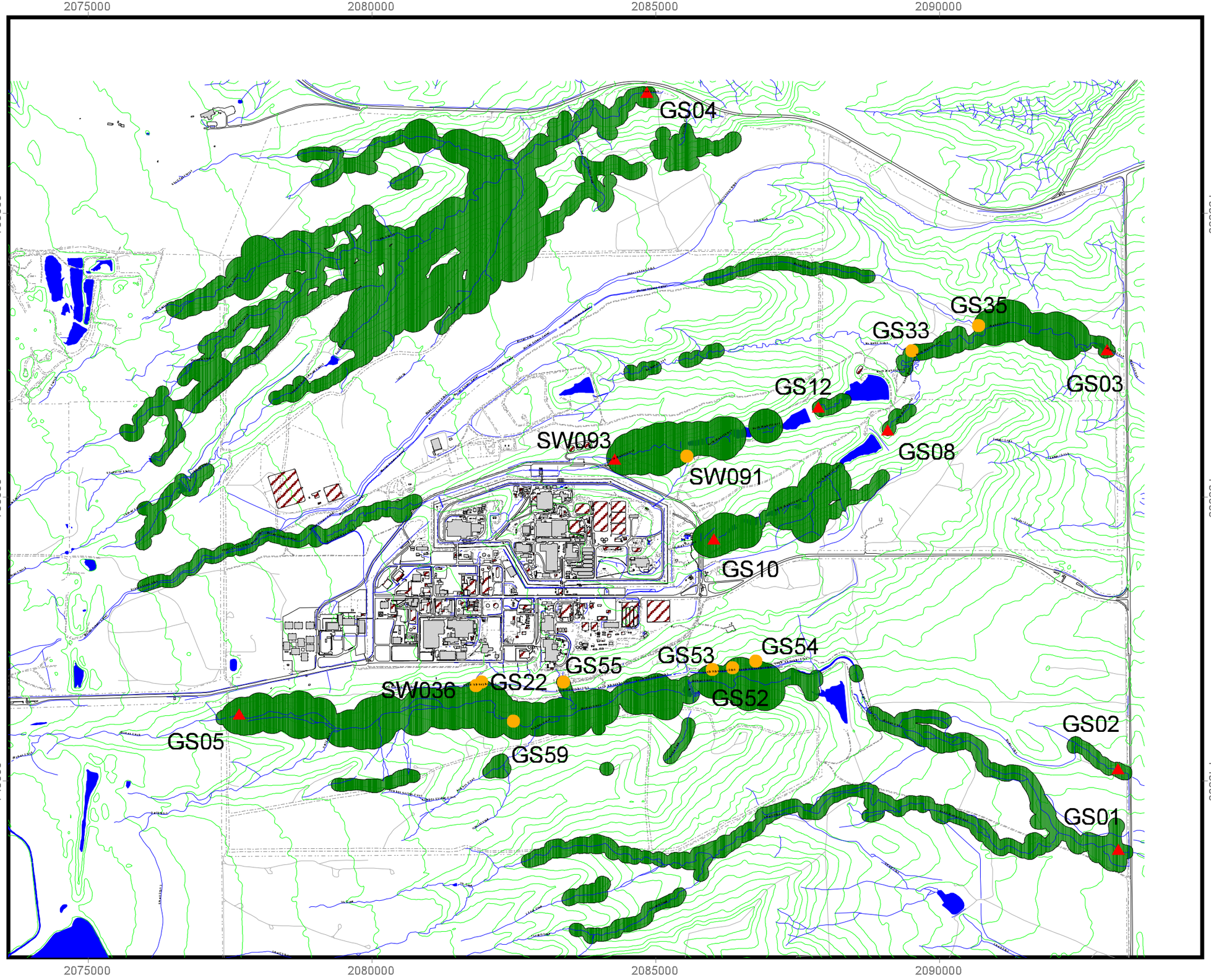
Figure 3. Generic Drawing of Notched Dam



Surface Water Flume Removal Locations At RFETS

Figure 4



Legend

- Permanent Flume Locations
- Temporary Flume Locations
- Current Preble's Protection Areas

Standard Features

- Buildings
- Demolished Buildings
- Lakes & ponds
- Streams & ditches
- Fences
- Paved roads
- Dirt roads
- Contours (20 ft. intervals)

DATA SOURCE BASE FEATURES:
Buildings, fences, hydrography, roads and other structures from 1994 aerial fly-over data captured by EG&G RSL, Las Vegas.
Digitized from the orthophotographs, 1/95.

N

1000 0 1000 Feet

State Plane Coordinate Projection
Colorado Central Zone
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RFETS GIS Dept.
303-966-7707

MAP ID: 04-0010

January 15, 2004

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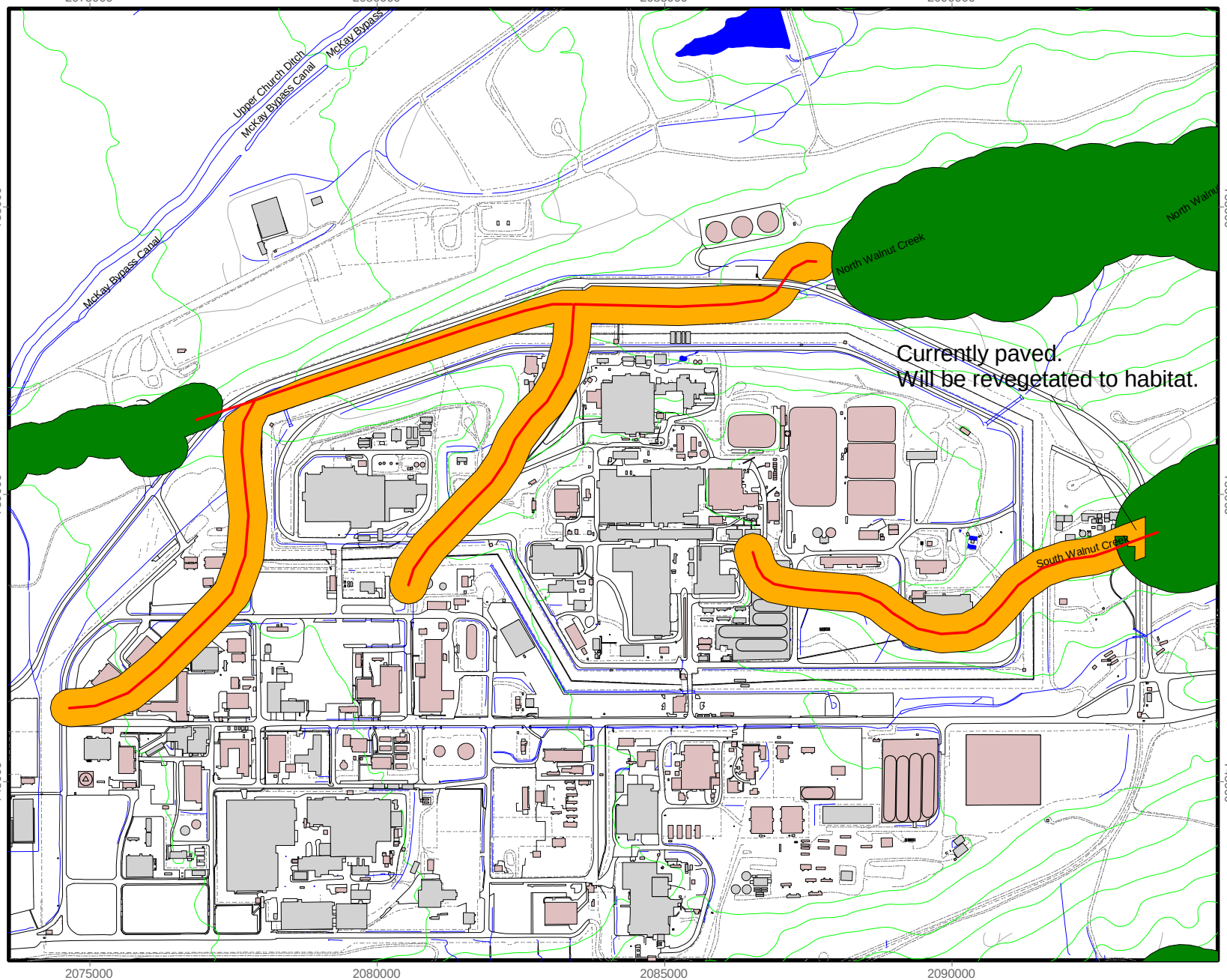

IA Preble's Mouse Habitat Creation

Figure 5

- Current Preble's Protection Areas
- IA Preble's Habitat Creation
- IA stream locations (reconnected or re-established)

Standard Features

- Buildings
- Demolished Buildings
- Lakes & ponds
- Streams & ditches
- Fences
- Paved roads
- Dirt roads
- Contours (20 ft. intervals)

DATA SOURCE BASE FEATURES:
Buildings, fences, hydrography, roads and other structures from 1994 aerial fly-over data captured by EG&G RSL, Las Vegas.
Digitized from the orthophotographs, 1/95.

N

500 0 500 Feet

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD27

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January 15, 2004

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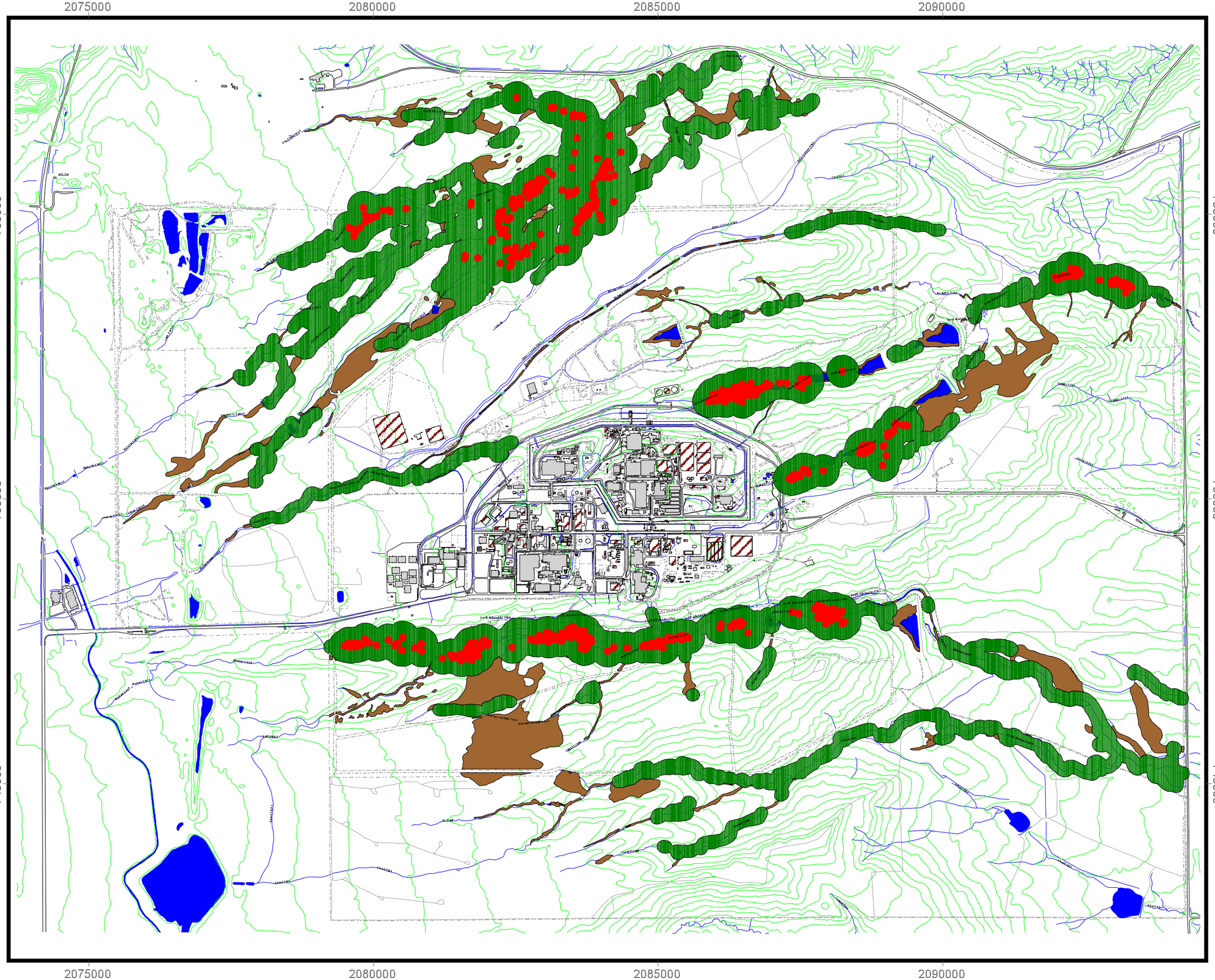
Preble's Meadow Jumping Mouse Current Protection Areas at RFETS December 2003

Figure 6



Legend

- Current Preble's Protection Areas
- Contiguous Wetlands
- Preble's mouse telemetry points

Standard Features

- Buildings
- Demolished Buildings
- Lakes & ponds
- Streams & ditches
- Fences
- Paved roads
- Dirt roads
- Contours (20 ft. intervals)

DATA SOURCE BASE FEATURES:
Buildings, fences, hydrography, roads and other structures from 1994 aerial fly-over data captured by EG&G RSL, Las Vegas.
Digitized from the orthophotographs, 1/95.

N

1000 0 1000 Feet

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by: Professional Environmental Group, L.L.C.

For: Kaiser-Hill Company, LLC

RFETS GIS Dept.
303-966-7707

MAP ID: 04-0006

December 16, 2003

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